The University of Melbourne, Department of Paediatrics and Murdoch Childrens Research Institute

Faculty of Medicine, Dentistry & Health Sciences

HONOURS & MASTERS PROJECTS 2025

Honours and Master of Biomedical Science

Online webinar will be held on **Tuesday 3 September at 4.30pm**

Register here

Honours and Masters Information Evening in person, **Thursday 12 September, 4.30pm onwards**
Register here

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Laboratory based

Infection and Immunity

1. Systems serology analysis of single dose HPV vaccination in Mongolia

A single dose of human papillomavirus (HPV) vaccine appears to be as efficacious against HPV infection, the prerequisite of cervical cancer, as two or three doses, despite inducing lower antibody titers. Neutralizing antibodies are thought to be the primary mediator of protection, but the threshold for protection is unknown. Antibody functions beyond neutralization have not been explored for HPV vaccines. This project aims to examine antibody profiles (isotypes, subclasses) and features (Fc receptors) in the serum of girls vaccinated with a single dose of HPV vaccine in Mongolia. This study will involve multiplex fluorescent assays to several HPV types as well as methods for production and validation of HPV pseudovirus.

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Available as Masters Project: Yes

2. Investigating M. abcessus infection in the lung epithelium

The incidence of non-tuberculous mycobacteria infections has been steadily increasing worldwide. Mycobacterium abscessus (M. abscessus) can cause lung infections in both seemingly healthy individuals and patients with chronic lung diseases, such as cystic fibrosis, bronchiectasis and emphysema. This is of concern, as treatment of these infections is difficult due to antibiotic resistance. Understanding the pathogenesis of M. abscessus infection in the lung is urgently needed. The lung epithelium is the first line of defense against inhaled pathogens; however, to date little is understood about how M. abscessus infects these cells. This project will use novel induced-pluripotent stem cell (iPSC)-derived lung epithelial cell platforms to address this knowledge gap. This project will establish for the first time an M. abcessus-infection model of iPSC-derived lung epithelial cells and characterize the cellular response to infection. This will include determining bacterial load (e.g., colony forming assays, imaging of immunofluorescent bacteria), and elucidating the host's innate response to infection (e.g., cytokine arrays, single-cell RNA-seq) to identify novel therapeutic targets to M. abscessus in the lung.

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3. Changes in the pneumococcal population following vaccine introduction

Streptococcus pneumoniae (the pneumococcus) is a bacterial pathogen and a leading cause of morbidity and mortality worldwide. Pneumococci are classified into serotypes based on the type of capsule they produce. Although safe and effective vaccines that target of a subset of these serotypes have been available for over two decades, introduction in many low- and middle-income countries (where the burden of pneumococcal disease is greatest) is frustratingly slow. Vaccine introduction also leads to profound changes in the pneumococcal population structure. This can include a decline in vaccine-serotypes and replacement with non-vaccine-serotypes. Changes to the capsule of some strains means they are not recognized by vaccine-induced immunity (serotype switches, variants and new serotypes). However, these changes in the pneumococcal population have rarely been examined in low- and middle-income countries. In this project, you will leverage our unique set of samples from the Asia-Pacific to examine changes in the genetics of the pneumococcal population following vaccine introduction. Key approaches to this project include using genomics, bioinformatics, molecular biology, genetic manipulation of pneumococcal isolates and testing in a range of microbiological assays in vitro. Optional aspects include testing isolates in murine models of carriage, transmission and disease. Your research will provide new insights into how pneumococcal populations can change following vaccine introduction in high disease burden settings including Asia

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4. Understanding streptococcal pathogenesis

Streptococcus pyogenes ('Strep A', group A streptococcus) is an important global pathogen. In a related bacterial species, Streptococcus pneumoniae, we and others have shown that viral co-infection can enhance bacterial virulence, by increasing bacterial density and inflammation in the host, and by driving changes in bacterial virulence gene expression. There is recent clinical epidemiologic evidence that viruses are also important in S. pyogenes pathogenesis, but little is known about this process. In this project, you will use murine and cell-culture models to examine the effect of viruses on S. pyogenes colonisation, transmission (spread to co-housed littermates) and disease, and the mechanisms involved. To achieve these aims, you will employ a range of methods such as bacterial transcriptomics, working with in vitro and/or in vivo models such respiratory cells from patients grown as air-liquid interface, genetic manipulation, as well as microbiological and immunological analysis of local and systemic samples. Your project will provide important novel data on key components of S. pyogenes pathogenesis and inform a pathway towards improving strategies for preventing S. pyogenes infections.

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5. Examining RSV infection using air-liquid interface models

Respiratory syncytial virus (RSV) infection commonly causes acute lower respiratory tract infections in children under 2 years of age. This virus infects the lower airways leading to a range of pathological features including inflammation, mucus production and disruption of the airway epithelial barrier. Development of reliable models of RSV infection will enable better identification of the pathological processes and also the examination of novel interventions. Currently there are several models used for studying RSV infection, such as mouse and lamb models, but these all have limitations in recapitulating some of the features of RSV infection. In this project, we will use an air-liquid interface (ALI) model to study RSV infection and the host response. In collaboration with the Royal Children's Hospital, we will use cultured primary human nasal epithelial cells from patients to study the effects of RSV infection on pathological responses as well as host responses such as inflammatory cytokine mediators. This project will involve the use of multiple techniques including RSV culture and quantitation, cell culture of primary human cells, gene expression and cytokine assays. Depending on time, we will also plan to examine the effect of novel anti-inflammatory compounds on RSV infection.

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6. Investigating the anti-microbial effects of LSF against antibiotic-resistant superbugs in relevant in vitro and in vivo models

L-sulforaphane (LSF) is a naturally-occurring antioxidant and anti-inflammatory compound derived from cruciferous vegetables such as broccoli and cauliflower. We and others have extensively documented the effects of LSF in a number of animal and human models including asthma and in vitro models of bacterial and viral infection, including pneumococcus, Group A Strep, RSV and SARS-CoV-2. LSF has a broad range of biological effects across diverse bacterial pathogens although studies in relevant models of infection are lacking. Considering the potential of LSF in treating antibiotic-resistant infections, this project aims to explore the beneficial effects of LSF in vitro and in vivo using specific models of bacterial infection at MCRI. This project will involve the use of a variety of experimental techniques including cell culture, animal experimentation, gene expression and cytokine assays.

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7. Beyond the clinical outcomes of the BRACE randomised controlled trial

Interested in being part of the largest BCG (Bacille Calmette-Guérin) vaccine trial of its kind worldwide? The BRACE trial is our international RCT of 6828 healthcare workers across 36 sites in five countries. This trial is working to determine if BCG vaccination reduces the impact of COVID-19 and other respiratory diseases. In addition to data on symptoms during respiratory illness including COVID-19, participants provided information on COVID-19 risk factors, vaccinations and vaccine reactions, as well as blood samples for assessment of immune responses. Using data collected from participants in the BRACE trial and existing immunological data we have a range of projects available investigating the interplay between COVID-19 symptoms, risk factors, vaccine responses and vaccine reactions. In addition, we have several projects involving immunological analysis of samples from the BRACE trial to investigate the how BCG changes the immune system and the associations between immune markers and clinical outcomes (e.g. COVID-19 risk and vaccine reactions). The Infectious Diseases Laboratory is located at the Murdoch Children's Research Institute, part of the Melbourne Children's Campus, which also includes the Royal Children's Hospital and the University of Melbourne.

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Available as Masters Project: Yes

8. Controlled Human Infection Model of Strep A Impetigo

Strep A (Streptococcus pyogenes) is a human-specific bacteria that causes a wide range of diseases, from pharyngitis and skin infection, to toxic shock and necrotising fasciitis, and autoimmune diseases like rheumatic heart disease. Our group have the world's only controlled human infection model of Strep A pharyngitis, which has allowed us unprecedented investigation of early stages of disease and immune responses. We are planning to expand this model to include Strep A skin infections (impetigo). In this project you will employ a range of microbiology and immunology techniques to develop the strain which will be used in the skin challenge model. You will take a subset of strains to characterise growth kinetics under specific conditions, use tissue culture to measure adhesion to skin cells in vitro, and measure bacterial gene expression of key virulence factors. You may also contribute to setting up new tests to measure the immune responses in the skin and establishing methods to apply the bacteria to the skin. This project will be instrumental in establishing the skin challenge model and progressing development of a vaccine against all Strep A diseases.

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Available as Masters Project: No

9. Developing a novel method to make antibiotic blood tests easier for kids and impact on antimicrobial resistance

Antimicrobial resistance (AMR) is a global health crisis threatening the effectiveness of antibiotics. When first-line antibiotics don't appear to be working, it is tempting to use broad-spectrum antibiotics instead, but this just increases AMR. What if the dose of the narrow-spectrum antibiotic just isn't high enough? This has been done in adults, but the problem for children is that it is difficult to do frequent blood tests because of the pain involved and when they're little, they have very small veins. However, children tolerate having finger prick blood tests very well. This honours project aims to develop a novel finger prick blood test for testing antibiotic levels. The project involves using liquid chromatography with tandem mass spectrometry as a powerful analytical technique to measure very small samples. You will be developing and cross-validating an assay in the laboratory for measuring antibiotic levels in dried blood spots from children. You will learn how to use high-performance liquid chromatography and tandem mass spectrometry instruments in the process. The goal is to measure antibiotic levels in dried blood spots and publish this technique. This will allow us to research how to use first-line antibiotics more effectively in children and neonates and dose-adjust childhood antibiotics individually. The impact will be to reduce development of AMR, preserving antibiotics into children's futures.

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Available as Masters Project: No

10. Optimising the use of first line antibiotics in children to impact on antimicrobial resistance

Antimicrobial resistance (AMR) is a global health crisis threatening the effectiveness of antibiotics. Maximising the use of first-line antibiotics is important for preserving broad-spectrum antibiotics for when they are really needed. Non-steroidal anti-inflammatory drugs (NSAIDs, eg ibuprofen) are commonly used in children to treat pain and fever. However, they have an additional effect of decreasing renal blood flow, potentially reducing excretion of antibiotics. By extending their half-life in the blood, the number of doses needed can be reduced, which gives more treatment options, both in hospital and home. This honours project aims to determine whether administering NSAIDs in combination with a first-line antibiotic can reduce dosing frequency. The project involves 1) recruitment and consenting of patients in person, 2) laboratory-based development of an assay using high-performance liquid chromatography, and 3) quantification of antibiotic levels in patient samples. The goal is to determine the effect of NSAIDs on the pharmacokinetics of antibiotics and publish this finding. This will allow us to do a randomised study using this technique for children with serious infections. The impact will be to get more kids out of hospital to home, improving their recovery time and reducing development of AMR.

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Genetics

11. Improving outcomes of mitochondrial diseases using human stem cell models

Mitochondria are our cellular power plants that burn sugars, fats and proteins to generate energy. Each week in Australia a child is born with a severe mitochondrial disorder. Many of these children die in the first years of life and most suffer from severe disease, particularly affecting their brain and/or heart. Access to these tissues from patients is limited, making it difficult to assess the impact on mitochondrial and other pathways contributing to disease pathology. This project involves the characterization of human pluripotent stem cell models of mitochondrial energy generation disorders that can be differentiated into clinically relevant cell types. The aims include:

1) Developing cellular models of mitochondrial disease using human Embryonic Stem Cells (hESCs) and human Induced Pluripotent Stem Cells (iPSCs) to study phenotypic rescue of novel defects, pathogenicity and treatment approaches.

2) Characterize pathogenic pathways by assessing the impact of these energy generation defects on cardiomyocytes generated from hESCs or iPSCs, as well as their impact on mitochondrial function and cellular physiology.

3) Define the impact of targeted therapeutic strategies in these models on the cellular proteome and other markers of cellular homeostasis. We have established a mitochondrial disease panel of hESCs using CRISPR/Cas9 mediated gene disruption, and iPCs from mitochondrial disease patient fibroblasts.

This project will validate selected cell lines from this panel and differentiate them to cardiomyocytes to assess the impact of the gene knockout on various aspects of mitochondrial and cellular function. Molecular and cellular characterizations may include generation of correction lines, mitochondrial and cellular functional assays (e.g. ATP synthesis, fluorescence microscopy, FACS, multi-electrode arrays), quantitative proteomics and RNAseq. Students will develop skills in cell culture, molecular biology and biochemistry.

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12. Investigating Optic Nerve Atrophy in KIF1A-Associated Neurological Disorders Mouse Model.

KIF1A-Associated Neurological Disorders (KAND) are a group of rare genetic conditions caused by mutations in the KIF1A gene. These disorders lead to a range of neurological symptoms, including optic nerve atrophy, which can result in vision loss and significant impairment in quality of life. Despite the critical importance of understanding optic nerve degeneration in KAND, there is a lack of comprehensive research on the mechanisms underlying this condition.

This study aims to investigate optic nerve atrophy using existing optic nerve samples from a KAND mouse model, Kif1algdg with the p.(Leu181Phe) variation, to elucidate the pathological mechanisms and identify potential therapeutic targets. Hypothesis: Mutations in the KIF1A gene result in significant morphological and molecular changes in the optic nerve, leading to optic nerve atrophy in individuals with KAND. These changes can be characterized to provide insights into the underlying disease mechanisms and identify potential therapeutic targets. Aims: This study will utilize existing eye-optic nerve samples from a KAND mouse model carrying a known pathogenic variant in the KIF1A gene. The study will involve a combination of histological, molecular, and functional analyses. Aim 1: To delineate the morphological alterations in the optic nerve associated with KAND using histological and immunofluorescence techniques in optic nerve tissue samples from Kif1algdg. Optic nerve sections will be stained using hematoxylin and eosin (H&E) and immunohistochemistry (IHC) to assess morphological changes and protein expression. Morphological changes will be quantified using image analysis software. Axonal density, myelin integrity, and glial cell activation will be assessed. Aim 2: To uncover specific protein expression changes in the optic nerve tissues from KIF1A mouse model using proteomics. Proteomics will be carried out on the eye-optic nerve samples. Key dysregulated proteins will be identified, and quantitative PCR and Western blot techniques will be then used to validate the identified differentially expressed proteins. Outcomes: This project will provide a comprehensive description of the morphological changes in the optic nerve associated with KAND. It will identify key molecular pathways and markers involved in optic nerve atrophy, addressing the existing knowledge gap in understanding the mechanisms underlying optic nerve degeneration in KAND. Supervisors: Dr. Simranpreet Kaur, Prof John Christodoulou, A/Prof Wendy Gold

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Available as Masters Project: Yes

13. Muscle matters: using patient models and mice to study genetic muscle disorders

Genetic muscle diseases significantly impact global health, causing progressive disability and reducing quality of life for millions. The urgent need for advanced research is underscored by limited treatment options. Our laboratory focuses on muscular dystrophies, progressive genetic disorders marked by muscle weakness and degeneration. This project aims to advance our understanding of limb girdle muscular dystrophies, focusing on progressive muscle weakness due to genetic mutations. Students will work with both animal models and 3D muscle constructs derived from stem cells. The project includes functional muscle assessments, histological and immunohistochemical analyses, and investigations into muscle metabolism. Other techniques such as transcript analysis and western blotting will be employed to analyze gene expression and protein levels related to muscle function and repair. Supervised by the muscle research team at the Murdoch Children's Research Institute, this project offers a

valuable opportunity to contribute to the development of a novel disease model to employ therapeutic strategies for the treatment of muscular dystrophies.

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Available as Masters Project: Yes

14. Discovering novel genes and pathways to ataxia

Ataxia is the term for a group of neurological diseases that affect movement and coordination, impacting ~1:15,000 individuals. While there is considerable evidence that gene mutations cause ataxia, currently only ~30% of affected individuals receive a genetic diagnosis. A focus of our research is to identify novel genes that cause ataxia. We have recently identified several novel genetic causes of ataxia, caused by pathogenic repeat expansions. This is when a segment of repetitive DNA, termed a short tandem repeat, is significantly expanded in size compared to the general population. This project will utilise modern genomic technologies, including exome and genome sequencing and transcriptomics to characterise the size and structure of these novel repeat expansions. Subsequently, the genes will be characterised in patient-derived cells to study disease-specific mechanisms and identify potential therapeutic treatments. The successful candidate will have the opportunity to learn a range of laboratory techniques including generating and analysing Next Generation Sequence data, cell culture, immunocytochemistry, microscopy, real-time qPCR and western blot analysis. In addition, they will work closely with clinicians and bioinformaticians within a large multidisciplinary team.

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Available as Masters Project: Yes

15. Exploring treatments for genetic forms of intellectual disability

Studies into human cortical development (or corticogenesis) have identified unique cellular processes during embryogenesis which further our understanding of how the human cortex is formed. However, primary human neuronal tissue can be difficult to source and is less amenable to genetic and cellular manipulation for experimental purposes. Therefore, researchers have turned to human pluripotent stem cells (hPSC's) to model human cortical development in culture. hESC's are highly expandable which allows for scaled up experimentation and established cortical differentiation protocols mimic key cellular hallmarks of corticogenesis such as neural stem cell proliferation, synaptic maturity, neurite morphology and activity. A growing body of genetic evidence has identified a large number of epigenetic regulator genes to be associated with neurodevelopmental disorders resulting in intellectual

disability, suggesting that neurodevelopment is susceptible to epigenetic changes as neurons develop and mature. How these genes affect neuron-specific functions at the cellular level is largely unexplored. Furthermore, epigenetics is a reversible process and highly dynamic and can be manipulated to increase or decrease epigenetics marks with appropriate inhibitor or activator molecules. This therefore provides the opportunity to 'tune' these epigenetic marks in a therapeutic manner to restore proper epigenetic regulation within this set of neurodevelopmental disorders. The aim of this project is to 1) generate CRISPR/Cas9-mediated knockouts of epigenetic regulator genes associated with intellectual disability, 2) characterise their role in corticogenesis using a stem cell-based model of cortical development, and 3) assess a range of epigenetic inhibitor and activator molecule treatments to determine if they ameliorate disorder-specific deficits. This project will CRISPR/Cas9 gene editing, clonal generation of knockout stem cell lines, live-cell imaging of stem cell-derived neurons using virally delivered fluorescent reporters to assess cell proliferation, synaptogenesis, maturation, neurite extension and activity, and biochemical assays to assess changes in histone modifications during neuronal development in the knockout neurons.

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16. Investigating histopathology of muscular dystrophies: focus on immune cells in human biopsies

Muscular Dystrophies are a group of genetic muscle diseases, some of which have inflammation contributing to disease pathogenesis. The immune cells infiltrating muscle is not well described in humans for some of these muscular dystrophies. This project will investigate human muscle biopsies using markers to identify different subtypes of immune cells. The immune infiltrates between different conditions of muscular dystrophies will be compared (Duchenne, Limb Girdle, Facioscapulohumeral MD). Subtypes of immune cells will be correlated with histological features of muscle damage. Quantitative real-time PCR will also be used to assess markers of immune cells present in muscle biopsies between the different muscular dystrophy conditions.

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Cell Biology

17. Creating a new iPSC-based platform to understand pulmonary fibrosis

Idiopathic pulmonary fibrosis (IPF) is a chronic and progressive lung disease, characterized by scarring of the lung tissue, leading to difficulty breathing. Treatment options for patients with IPF are limited, likely in part because the pathogenesis of IPF is not entirely understood. This project will develop a novel human platform using induced-pluripotent stem cells (iPSC) to study pulmonary fibrosis. Using established directed differentiation protocols iPSC-derived alveolar epithelial cells and fibroblasts will be derived. This project will functionally characterize this platform to study pulmonary fibrosis, using techniques such as immunofluorescence and histology, RNA sequencing, and Western blotting. This novel human iPSC-based platform will be vital in future research studying pulmonary fibrosis and identifying novel therapeutic targets.

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Non-laboratory based

Infection and Immunity

18. Feasibility and Efficacy of Remote Monitoring of Non-Invasive Ventilation (NIV) in Children

Non-invasive ventilation (NIV) is indicated for children with sleep-disordered breathing & those who develop chronic respiratory failure. It requires regular monitoring to ensure safety, optimal outcomes, & therapy adherence. Recent guidelines have highlighted increasing complexity & the need for home-based ventilatory support, underscored by the importance of tailored long-term care plans. The guidelines advocate for the use of advanced remote monitoring (RM) technologies to enhance the management & adherence of ventilatory support in paediatric patients.

- To assess the reliability & effectiveness of RM compared to manual downloads.
- To evaluate the added value of home monitoring with oxycapnography & respiratory effort bands in managing NIV & to identify discrepancies in ventilation parameters & patient compliance between RM & manual data retrieval methods. All children requiring NIV (BiPAP) attending the RCH (n~90) will be invited to participate. Data will be collected at 2 time points, from RM reports & manual downloads. Selected patients will undergo home monitoring using oxycapnography & respiratory effort bands. Data analysis will compare ventilation parameters & patient compliance from RM & manual downloads to assess consistency. The effectiveness of oxycapnography & respiratory effort bands in identifying ventilation issues will be evaluated.

The findings will provide valuable insights into the feasibility & efficacy of RM technologies in paediatric home ventilation. Overall, the study aims to enhance patient outcomes &quality of life through more effective & efficient monitoring strategies. Additionally, the study has potential to reduce healthcare costs by decreasing the need for hospital visits through effective home monitoring. This research will contribute to developing guidelines & best practices for RM of paediatric home ventilation, ensuring equitable access to high-quality care across different regions. The built-in software in home NIV devices, as highlighted in recent studies, shows promise in effectively managing patient-ventilator synchronization & handling unintentional leaks, thus improving overall NIV performance.

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Genetics

19. Increasing diversity in Australian genomic databases

The current lack of diversity in genomic databases means that patients from underrepresented populations are less likely to receive an accurate genetic diagnosis, leading to poorer health outcomes. This honours project will tie into a large Medical Research Futures Fund (MRFF) project led by Prof Daniel MacArthur at the Centre for Population Genomics (a collaboration between the Garvan Institute of Medical Research and the Murdoch Children's Research Institute), which is developing a more representative genomic database for the Australian population. The honours project will use empirical data to explore ethical issues relating to the use of incentives to encourage participation in genomic database research.

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20. Understanding the Lived Experiences of Individuals and Families Affected by KIF1A-Associated Neurological Disorders: A Qualitative Approach

Introduction KIF1A-Associated Neurological Disorders (KAND) are rare genetic conditions caused by mutations in the KIF1A gene. These disorders lead to a wide range of neurological

symptoms, including developmental delay, motor dysfunction, and intellectual disability. Despite the growing interest in understanding KAND, there is limited qualitative research exploring the personal experiences of individuals and families affected by these conditions. This study aims to fill this gap by capturing and analysing their lived experiences. Research Questions

1. What are the daily challenges faced by individuals living with KAND?
2. How do families cope with the diagnosis and ongoing care of a loved one with KAND?
3. What are the perceived gaps in medical, educational, and social support for those affected by KAND?
4. How do individuals and families affected by KAND perceive their quality of life and future outlook? Objectives

- To understand the personal and social impact of KAND on affected individuals and their families.
- To identify common coping strategies and support mechanisms utilized by families.
- To highlight areas for improvement in healthcare, education, and social services for KAND patients.
- To contribute to the body of knowledge on rare neurological disorders and inform future research and policy. Methodology Study Design A qualitative research design will be employed to explore the experiences and perceptions of individuals and families affected by KAND. This study will use in-depth interviews as the primary data collection method. Participants Participants will include:
- Individuals diagnosed with KAND (if cognitively able to participate).
- Parents or primary caregivers of individuals with KAND.
- Siblings of individuals with KAND. Participants will be recruited through KAND patient advocacy groups, social media platforms, and healthcare providers specializing in genetic and neurological disorders.

Data Collection

In-depth Interviews: Semi-structured interviews will be conducted with participants to gather detailed narratives about their experiences. Interviews will be conducted in person, over the phone, or via video conferencing, depending on participants' preferences and geographical locations.

Focus Groups: Where feasible, focus groups with families will be organized to facilitate shared experiences and collective insights. Data Analysis Thematic analysis will be used to analyse the interview transcripts. This will involve:

- Transcribing interviews verbatim.
- Coding the transcripts to identify recurring themes and patterns.
- Developing a thematic framework to organize and interpret the data.
- Ensuring reliability and validity through member checking and triangulation. Expected Outcomes
- A comprehensive understanding of the lived experiences of individuals and families affected by KAND.
- Identification of key challenges and support needs.

- Recommendations for healthcare providers, policymakers, and support organizations to improve services for KAND patients.

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Cell Biology

21. Analysis of spatial data in congenital heart diseases

Congenital heart disease affects 1 in 100 babies. Spatial gene expression patterns are critical to understand how the heart develops and what underlying genetic patterns are behind heart malformation. High-throughput spatial temporal data have been recently generated with spatial transcriptomics technologies. Capitalising on these rich datasets, we aim to build a custom analysis workflow in which the cells are profiled with precise spatial gene expression information. The student will provide fundamental contribution to of this project, by: (1) analysing the spatial and single-cell RNA-seq datasets; (2) cross-validating the pattern in independent datasets and (3) associating observed spatial patterns with known literature in congenital heart disease. Skills focus: proficiency in one programming language (e.g. Matlab, R, Python), basic understanding of cell and development biology, simulation, data visualisation, bulk / single-cell RNA-sequencing analysis. Laboratory Links: https://ramialison-lab.github.io/index.html

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Clinical Sciences

22. The effect of anti-epileptic drugs on bone health

This project builds on pilot data from our group, in taking the next steps to set up a longitudinal cohort of young people taking anti-epileptic drugs, with sibling controls. Participants will undergo assessments of bone density and muscle function, along with biochemical testing and questionnaires to establish risk factors for bone health outcomes. The cohort will be followed for 3-5 yrs; the student will gain invaluable experience in setting up the cohort, establishing

baseline data, undertaking analysis of these data including advanced analysis techniques such as finite element modelling.

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23. Newborn pain management

Multisite neonatal pain point prevalence study examining pain management during newborn screening/other newborn blood tests. Data will be collected from 30 babies/unit in 10 units. Eligible newborns will be from neonatal intensive care units or special care/High Dependency units who are eligible to be held skin-skin by parents.

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24. Bone Microarchitecture in children with XLH: BMX Study

X-linked hypophosphatemic rickets is the most common hereditary form of rickets. In recent years, the advent of monoclonal antibody therapy has significantly improved outcomes. However, our understanding of its effects on bony microarchitecture (and therefore bone strength, and ultimately fracture risk) is limited. We propose to explore this by recruiting 30 patients at RCH and other sites with XLH who are taking burosumab, and compare their microarchitecture with 30 controls, using high resolution peripheral quantitative computed tomography (HR-pQCT). We will also undertake traditional bone density testing with dual-energy Xray absorptiometry (DXA), as well as exploring muscle function and day to day activity levels. The subjects will largely come from RCH, but we are partnering with Monash University, as they have access to one of the few HR-pQCT scanners in Australia. The data from these scans will provide highly novel insights into bone development in these patients, and hopefully assist in our understanding of the effect of burosumab therapy and assisting in maximising utilization.

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Available as Masters Project: Yes

25. Psychosocial outcomes of parents of young children with anorectal malformations

Parents of children born with anorectal malformations (ARM) face unique diagnostic and management challenges, especially in the early years. This project is focused upon the application of validated questionnaires to evaluate the psychosocial outcomes of parents/carers of children with ARM. This is part of a larger longitudinal study involving the Colorectal and Pelvic Reconstruction Service (Department of Paediatric Surgery) at The Royal Children's Hospital and Murdoch Children's Research Institute.

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Available as Masters Project: Yes

26. Psychosocial outcomes of parents of young children with Hirschsprung disease

Parents of children born with Hirschsprung disease (HD) face unique diagnostic and management challenges, especially in the early years. This project is focused upon the application of validated questionnaires to evaluate the psychosocial outcomes of parents/carers of children with HD. This is part of a larger longitudinal study involving the Colorectal and Pelvic Reconstruction Service (Department of Paediatric Surgery) at The Royal Children's Hospital and Murdoch Children's Research Institute.

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Available as Masters Project: Yes

27. Sleep quality and fatigue in children with Charcot-Marie-Tooth disease

ONLY AVAILABLE AS A MASTERS PROJECT Introduction: Charcot-Marie-Tooth disease (CMT) refers to a group of inherited neuropathies. It is the most common peripheral neuropathy of childhood, affecting 1 in 5000 children. Symptoms often begin in childhood, and include weakness, mobility impairment and foot deformity. Fatigue is also common and affects quality of life. An increased prevalence of sleep disorders is reported in adults with CMT but this has not been studied in children. We hypothesise that sleep disturbance is under-recognised, and represents a modifiable contributor to fatigue in children with CMT. Manifestations of sleep disturbance and fatigue are expected to have considerable impact on mental health, academic performance and quality of life in children with CMT. There are no studies evaluating sleep and fatigue in Australian children with CMT and no studies examining the frequency of sleep

disorders. The RCH hosts a statewide neuromuscular clinical service and the RCH has a tertiary sleep service.

Aims: In the current population of children with CMT attending the RCH:

- to determine the prevalence of fatigue and evaluate sleep quality (objective and subjective)
- to assess the relationship between fatigue and sleep quality
- to evaluate the impact of fatigue and sleep disturbance on HRQOL, mood and physical activity.

Methods: All children with CMT attending RCH will be offered participation in this study. Participants and their parents/carer will be asked to complete sleep, fatigue, HRQOL, physical activity and mood questionnaires and referred for overnight sleep study (PSG). The data collected will be analysed by the student. Clinical implications: Sleep disruption may significantly impair health-related quality of life, physical activity, and exacerbate fatigue and mental health problems in children with CMT. In order to optimise medical management of children with CMT, it is important to understand the magnitude of sleep disorders and their impact in this population.

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Available as Masters Project: Yes

28. Can resting-state functional MRI identify language lateralisation for presurgical planning in pediatric epilepsy?

Epilepsy can be effectively treated by surgical resection of epileptogenic cortex. As part of presurgical investigations, language functional magnetic resonance imaging (fMRI) is used to determine which side of the brain language is represented on ('language lateralisation'), and whether the language network is near the resection target. Thus, language lateralisation is key to determining surgical candidacy and informing surgical risk. During language fMRI, patients perform cognitive word-generation tasks. For some patients, language fMRI is not possible due to young age, cognitive or other factors. An alternative is resting-state fMRI, which measures brain activity while patients are resting or anaesthetised. 'Language-like' networks can be identified within resting-state data. At Royal Children's Hospital, resting-state fMRI has been acquired for some patients during routine epilepsy investigations. We would like to know whether resting-state fMRI is a valid source of information on language lateralisation in our data. This project is a retrospective analysis investigating whether 'language-like' components of resting-state fMRI data show similar language lateralisation to the language networks measured using language fMRI, in our epilepsy cohort. Language fMRI laterality and other imaging metrics have been recorded in an existing database. The student will help gather resting-state fMRI data and identify language-like components, and will update relevant demographic information on the cohort. Using an existing framework, they will calculate laterality of language-like

components by transforming the data into a common space, measuring activity in language regions, and calculating Laterality Indices. These and other clinical and imaging metrics will be used in statistical models to investigate their association with language laterality already derived for language fMRI. The student will work with the Neuroscience Advanced Clinical Imaging Service (NACIS) in Department of Neurosurgery, RCH; Neurology, RCH; and Developmental Imaging, MCRI.

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Available as Masters Project: No

29. Understanding the relationship between cognitive development and quality of life in children and adolescents

There is strong evidence that key aspects of healthy development such as academic achievement, prosocial behaviours, and positive emotional health are underpinned by cognitive development, which in turn is dependent on healthy brain maturation. Unfortunately, current knowledge about brain-behaviour relationships and their maturation is limited. Major contributing factors to this are the cost and complexity of large-scale neuroimaging studies and a reliance on traditional psychological assessments that do not accurately reflect the nature and timing of development across different brain regions and the differential trajectories of brain-behaviour relationships from childhood to adulthood. In the COGNITION study, we address these limitations using a comprehensive battery of neuroscientifically informative cognitive tasks, recently updated to improve access and facilitate administration, to map brain maturation across the school-age years. This observational study will use the 'CANTAB' to reliably assess and describe cognitive development and brain maturation in children and young people without the need for expensive neuroimaging. Approximately 1300 participants (aged 5-18 years) will be tested twice, at baseline and approximately 12 months. There is an opportunity for a student to contribute to this study by investigating the relationships between neurocognitive development and quality of life. This project would suit a student with an interest in developmental psychology, neuropsychology, and education. The successful candidate will be supported by an experienced supervision team with expertise in developmental and educational psychology, neuropsychology, and child and adolescent psychiatry.

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Available as Masters Project: No

30. Assessing the need for post-operative ICU in children with complex neuromuscular and syndromic scoliosis.

The Royal Children's Hospital provides care for many children with neuromuscular conditions and syndromic conditions, with the most common and prototypical being cerebral palsy (CP). As a general rule, the more severe the functional limitations experienced by the child, the more likely the child is to develop a progressive scoliosis which may require surgical intervention. In children with cerebral palsy, the prevalence of scoliosis is directly related to gross motor function, as expressed by the Gross Motor Function Classification System (GMFCS). There are a broad array of syndromes and diseases that result in progressive musculoskeletal deformity. As a result, neuromuscular and syndromic scoliosis represent a wide spectrum of pathology with variability that must be managed by the paediatric spine service. Instrumented spinal corrective surgery has been the standard of care for scoliosis for several decades. This surgery is accompanied by a high risk of perioperative complications due to the medical complexity of this population, and many of these patients require post-operative care in an ICU. Pre-operative optimization is a key component in the management of these patients in order to minimise peri-operative risk and improve patient outcomes. It has been standard practice at our institution for several years that complex paediatric patients with scoliosis and underlying neuromuscular pathology are reviewed pre-operatively in a collaborative multidisciplinary clinic that serves to assess and optimize the care of these patients prior to scoliosis surgery. A major component of this pre-operative assessment is establishing whether the child is likely to require post-operative care in the ICU. Given that access to ICU care is an expensive and limited resource, it is ideal to only admit patients to ICU that would not be adequately cared for in a non-critical care environment. This study will use a retrospective chart review of all patients with syndromic and neuromuscular scoliosis who have undergone surgery at RCH over the past 5 years for scoliosis correction and will assess the peri-operative need for planned and/or unplanned ICU admission. The purpose of the study will be to develop as scoring system to provide objective criteria that can be used to predict the need for ICU care. This scoring system will then be used in a prospective manner to test the reliability of predicting the need for post-operative admission to ICU.

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Available as Masters Project: No

31. Divergence of typical brain development over childhood and adolescence: identifying cortical signatures of psychiatric symptomatology

The transition from childhood to adolescence is a dynamic period of development that involves remodelling and reorganisation of brain structure, partly in response to the rising pubertal hormone levels that cross the blood-brain barrier. Coinciding with brain reorganisation at the

time of pubertal onset, is an increased risk of onset of mental health disorders. In Australia, 50% of all lifetime cases of mental health disorders start by age 14. And about 50 per cent of people who develop a psychotic disorder - a condition that describes a person's loss of contact with reality, will do so by the time they are in their early 20s. Brain imaging studies using MRI have been key in revealing ongoing cortical thinning and volume loss over adolescence. However, the exact neurobiological mechanisms underlying these changes are unclear. Diffusion MRI is one way to access micro-metre structural properties in vivo. Cortical morphology and myelination abnormalities have been linked to various neuropsychiatric disorders, including psychosis. This project will aim to build a comprehensive understanding of typical cortical development of morphology and microstructure and assess deviations to typical patterns of cortical development with symptoms of psychosis. To do this, the student will leverage diffusion MRI data from previously collected datasets consisting of typically developing youth (such as the Philadelphia Neurodevelopmental Cohort, Developmental HCP) and longitudinal cohorts consisting of young people at-risk for, or diagnosed with, psychosis. The project will suit a student with a background in computational neuroscience and a keen interest in learning image processing and analysis.

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Available as Masters Project: Yes

32. Validation of the Functional Mobility Scale in Paediatric Neuromuscular Disease

The Functional Mobility Scale (FMS) was developed by researchers from the Hugh Williamson Gait Laboratory at The Royal Children's Hospital (RCH) and is widely used to characterise typical mobility in children with cerebral palsy. The Neuromuscular Clinic at RCH has used the FMS to describe typical mobility in children with neuromuscular diseases including muscular dystrophy, peripheral neuropathy and spinal muscular atrophy for the past decade. The FMS has been used by physiotherapists from the Neuromuscular clinic in both clinical and research cohorts. While the FMS is validated in cerebral palsy, it has not been formally validated in neuromuscular disease. This project will utilise a large existing data set to validate the FMS in neuromuscular disease.

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Available as Masters Project: Yes

33. The Self-and Others' emotion and Cognition in Adolescent Life (SOCIAL) study

Social processes, such as empathy and theory of mind, are vital for social functioning and building social competency in young people. Empathy is a social-affective process involving sharing someone's emotion. Theory of mind (ToM) on the other hand, is a social-cognitive process that involves reasoning about the thoughts or emotions of others. Both of these processes are required for successful social interactions. Impairments in these processes have been found in mental health and neurodevelopmental disorders. This project will validate an innovative empathy and ToM task for adolescents for use in the Magnetic Resonance Imaging (MRI) scanner. This will result in a tool for neuroscientists to investigate these processes, how they are impacted in clinical populations, and evaluate treatments aimed to improve social processes. Depending on length of project and student interest/experience, this project may involve the following: working with young people, fMRI task programming and piloting, investigation of psychophysiological or neural correlates of social processing.

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Available as Masters Project: Yes

34. Take C.A.Re (Concussion Assessment and Recovery Research) Team

Concussion is defined as a traumatic brain injury where an impulsive force, caused by direct blow to the head, neck or body, is transmitted to the brain, triggering a neurotransmitter and metabolic cascade, with possible axonal injury, blood flow change and inflammation affecting the brain. Concussion results in a constellation of non-specific and heterogeneous post-concussion symptoms (PCS), including balance impairment, somatic and/or emotional symptoms, cognitive impairment, and/or sleep disturbance. For most children and adults, PCS tend to resolve spontaneously within 2 to 4-weeks post-injury, however, approximately 30% will experience persisting PCS (pPCS) for greater than 4-weeks. pPCS can interfere with participation in school, sport, social, and recreational activities, with secondary consequences on mental health and quality of life. For the 30% of children and adolescents who experience pPCS, emerging biopsychosocial conceptualisations emphasise the contribution of injury, pre-injury, psychological, social, and environmental factors to the development and maintenance of these symptoms. Our team developed a multimodal intervention, Concussion Essentials (CE), that combines targeted education and management strategies for common symptoms, with physiotherapy and psychology treatment. Student projects could involve examination of child, parent or intervention factors that contribute to recovery of pPCS.

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Available as Masters Project: Yes

Population Health

35. Provision of an information video prior to an infant's diagnostic audiology assessment: A randomised controlled trial.

The Victorian Infant Hearing Screening Program (VIHSP) is a state-wide program that screens the hearing of newborn babies in their first few weeks of life. Early detection of a hearing impairment and remediation within the first months of life can significantly reduce the serious developmental impacts of infant hearing loss. Babies who do not pass their newborn hearing screen are referred for diagnostic audiology assessment. In Victoria diagnostic audiology clinics operate independently of VIHSP and of each other. Prior to the diagnostic appointment families are contact by both VIHSP and the audiology clinic and are provided with resources to help prepare a family for their infant's appointment (usual care). The information provided by audiology clinics may include written and/or verbal information of differing amounts and combinations. In 2020 VIHSP developed a video resource (diagnostic audiology information video - DAIV) that follows a mother and her infant as they attend the infant's audiology appointment. The video provides the viewer with both visual and auditory information about the audiology equipment, the likely sequence of events, the purpose of each test, and how best to prepare their infant for the appointment. This study is a randomized controlled design (usual care + pre-appointment information video) compared to the control (usual care only), with data collected via an online survey prior to the infant's appointment. The aim of the study is to assess if the diagnostic audiology information video provided prior to an infant's diagnostic audiology appointment increases parent/caregiver's knowledge and understanding of their infant's diagnostic audiology appointment and reduces anxiety about the appointments in the intervention group compared to the control group.

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Available as Masters Project: No

36. Protocol development: Using the available evidence to guide which risk indicators for post-natal hearing loss should be used by the Victorian Infant Hearing Screening Program (VIHSP)

The Victorian Infant Hearing Screening Program (VIHSP) is a state-wide program that screens the hearing of newborn babies in their first few weeks of life. Early detection of a hearing impairment and remediation within the first months of life can significantly reduce the serious developmental impacts of infant hearing loss. Some babies who pass their newborn hearing

screen are at risk of developing permanent hearing loss later in childhood - hereby referred to as post-natal hearing loss. Programs like VIHSP use risk indicators to identify which babies may be at risk of post-natal hearing loss and recommend these babies are referred for further audiological assessment later in the first year of life. The risk indicators used by programs like VIHSP have historically been based on best-practice guidelines and position statements.
This project will develop a protocol, identifying the evidence available for the risk indicators for post-natal hearing loss, to determine if there is sufficient evidence to retain, remove, or add risk indicators. The methodology will involve conducting a scoping review using existing systematic reviews, original articles including recent available evidence and grey literature. A metric will be generated to evaluate the evidence for each risk indicator identified within the literature in order to make a recommendation. The protocol will identify which risk indicators for postnatal hearing loss are recommended for use by VIHSP. The protocol will ultimately impact every baby born in Victoria and there will be scope to publish if interested.

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Available as Masters Project: No

37. Voice of the Child: what matters to deaf and hard of hearing children

The Australian National Child Hearing Health Outcomes Registry (ANCHOR) aims to measure deaf and hard of hearing children's outcomes through the different hearing health services they routinely access. To ensure services measure outcomes that matter to these children, their families, their services and policy makers, ANCHOR is conducting focus groups with deaf and hard of hearing children, young people and their families. This project aims to capture the voices of young deaf and hard of hearing children (aged up to 8 years old) using a 'Voice of the Child' toolbox developed through the Centre for Community Child Health. Results from piloting this toolbox will contribute towards development of a national core outcomes set for child hearing in Australia.

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Available as Masters Project: Yes

38. VicCHILD: Academic achievement and quality of life outcomes of deaf and hard of hearing children

Congenital hearing loss affects 1-3 per 1000 children. Over the last quarter century, remarkable advances have transformed these children's life chances: universal newborn hearing screening, early access to technology, intervention and cochlear implantation. Yet, early diagnosis and intervention do not guarantee improved outcomes. The Victorian Childhood Hearing Longitudinal Databank (VicCHILD) is a statewide databank (with more than 1200 deaf and hard of hearing children to date) designed to measure deaf and hard of hearing children's outcomes and determine their associated factors. www.mcri.edu.au/research/projects/vicchild This project aims to determine the academic achievement (measured by NAPLAN) +/- quality of life outcomes, of VicCHILD primary school aged children and their associations with child and family factors, using cross-sectional (+/- longitudinal) analysis. Research Questions: What are the educational and quality of life outcomes of deaf and hard of hearing primary-school aged children? What are the child and family factors that predict these outcomes?

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Available as Masters Project: Yes

39. Genotypes and phenotypes of auditory neuropathy - a quantitative data analysis

This study aims to explore the genetic and physical characteristics of individuals with auditory neuropathy, a type of congenital hearing loss. Our team is currently involved in an international gene therapy study regarding otoferlin gene (OTOF) - mediated hearing loss (https://www.mcri.edu.au/research/projects/auditory-neuropathy) As part of this study, we have provided genetic counselling and testing for individuals with auditory neuropathy and collected audiological data regarding the type and extent of their hearing loss. The student project will involve a quantitative analysis of audiological and genetic data that we have collected from individuals with auditory neuropathy who have participated in genetic counselling. The aim of the project is to further understand genetic contributions to auditory neuropathy and associated physical characteristics.

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Available as Masters Project: No

40. Early childhood neurodevelopmental trajectories

Optimal childhood neurodevelopment is key to a long and healthy life. Neurodevelopment refers to the brain's development of neurological pathways essential for establishing good communication, motor, problem solving and social skills later in life. It is marked by milestones in early life, such as smiling and sitting, that progress as the child grows. GenV is a whole-of-Victoria cohort of nearly 50,000 children and their parents recruited October 2021 to October 2023 (https://www.genv.org.au/). The cohort's very large size and diversity (with all Victorian population groups represented) and inclusion of all localities, along with collection of survey data from parents during the early years and data available from linkages to services, make it ideal for mapping neurodevelopmental trajectories in the first years of life that could be used to explore predictors and outcomes of child neurodevelopment. This Honours project will use GenV milestone data to identify, describe and determine the neurodevelopmental progress of GenV babies.

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Available as Masters Project: No

41. Family partnerships and engagement in primary schools relating to child mental health and wellbeing

An important part of the teacher and school leader role is engaging with parents. Evidence has shown that parent engagement in their child's education, has positive impacts on child wellbeing. School prioritisation of parent engagement can therefore form a positive, collaborative culture that values input from both parents and teachers, and ultimately benefits students. While teachers acknowledge the importance of family partnership for student mental health and wellbeing, complexity exists around engaging families and the need to increase mental health literacy and reduce stigma to support school-home partnership and facilitate children accessing support. The Mental Health in Primary Schools (MHiPS) initiative is a universal, whole-school approach to improve teacher and school capability to support student mental health and wellbeing, with broader benefits to the wider school community, such as parents. This project aims to explore parent engagement regarding student mental health and wellbeing following the introduction of the MHiPS initiative in Victorian schools.

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Available as Masters Project: Yes

42. Understanding profiles of student language and literacy

Using data from the Getting It Right study, this project will aim to identify language and literacy profiles for students in Grade 1. Data will be drawn from face to face assessments conducted with these children at school, enabling a detailed understanding of the function for each student.

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Dr Melissa
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Available as Masters Project: Yes

UNIVERSITY OF MELBOURNE HONOURS ENTRY REQUIREMENTS

To be eligible to enter the Bachelor of Biomedicine (Degree with Honours) or the Bachelor of Science (Degree with Honours), applicants must satisfy both:

- the Faculty of Medicine, Dentistry and Health Sciences (MDHS) or Faculty of Science entry requirements.
- and the requirements of the department offering the Honours program.

Please note demonstrated eligibility does not guarantee a place in the Honours program. All successful applicants will also need to be selected for admission by the Department. The University of Melbourne handbook contains detailed information about the subjects available and entry requirements for departments offering Honours. https://handbook.unimelb.edu.au

For further details please visit;

Department of Paediatrics:
www.paediatrics.unimelb.edu.au

MCRI: https://www.mcri.edu.au/students/honours-students

MDHS: http://sc.mdhs.unimelb.edu.au/entry-requirements

HOW TO APPLY - MDHS HONOURS

Course Codes:

Bachelor of Biomedicine (Honours) – **BH-BMED**

Bachelor of Science (Honours) – **BH-SCI**

RCH Academic Centre Enrolling Unit is: **Department of Paediatrics**

If you wish to be considered for Honours in 2025, and you would like to undertake your project and coursework with the Murdoch Childrens Research Institute, Royal Children's Hospital, Academic Centre, Faculty of Medicine and Dentistry Sciences with the enrolling unit being Department of Paediatrics, you will need to carry out a FOUR

STEP PROCESS.

STEP 1: Look for Projects and Contact Potential Supervisor (Note: 2024 Start Year Intake projects will be available in Sonia by mid-August.) You will need to decide which Supervisor(s) and Project(s) that you wish to apply for. To do this, contact potential supervisors listed in this Handbook, you should speak to them and organise a meeting to discuss the project further. Projects available for 2025 are also listed on the Murdoch Childrens Research Institute and Department of Paediatrics websites.

STEP 2: Submit Online Application: Register for the Honours Application Tracking System (SONIA) before making your application in SONIA. Lodge an online application by 31 October 2024 (Round 1), and 10 January 2025 (Round 2).

http://mdhs-study.unimelb.edu.au/degrees/honours/apply-now#apply-now

STEP 3: Submit Project preference in Sonia: For Round 1 applicants, once you have submitted an online course application and met the minimum entry requirements, you will receive an email within 3 working days with your personal login to access the Honours Project Preference System – Sonia. Please follow the instructions to set up your login and submit your project preferences. If you have applied for Round 2, you will be contacted in early January about project preference submission in Sonia. You may select up to 4 project preferences in Round 1 or 3 project preferences in Round 2 and mid-year. You **MUST** contact the relevant supervisor(s) and reach an agreement before selecting their projects. You can log into Sonia to change your preferences any time by the preference submission closing dates.

STEP 4: Respond to Your Offer: Round one offers for entry into 2025 will be issued around mid-December 2024. Students must accept their offer by the Offer Lapse Date notes in their offer letter. Students who meet the minimum entry requirements but are not made a Round 1 offer may be considered for Round 2 under specific circumstances, but that is not guaranteed.

Key Activities	Key Dates
Round 1 online course application closing date	31 October 2024
Round 1 Project preference closing date	10 November 2024
Round 2 Application closing date	10 January 2025
Round 2 Project preference closing date	16 January 2025

UNIVERSITY OF MELBOURNE MASTER OF BIOMEDICAL SCIENCE

The Master of Biomedical Science is a coursework program (Course code **MC-BMEDSC**) offered through the Department of Paediatrics. This program offers graduates a pathway into research or other science-based careers and can lead on to PhD studies. Students may consider undertaking a Masters as an alternative to the Honours Program.

Students undertake a major research project and discipline-specific coursework subjects offered by MDHS. A range of professional development subjects are offered to complement and enhance the research undertaken and to progress students' career opportunities.

MDHS: http://mdhs-study.unimelb.edu.au/degrees/master-of-biomedical-science/overview

MASTERS RESEARCH PROJECT

The Master of Biomedical Science is a two-year full-time course (four years part time) and mid-year entry is available. Students must complete 200 credit points comprising:

- Discipline-specific subjects (50 credit points)
- Professional skills subjects (25 credit points)
- Research subject (125 credit points)

The research subject is completed as a project under the supervision of experienced senior scientific researcher/s within a research group at the Murdoch Childrens Research Institute.

To organise the research project, students must speak to the prospective supervisor/s listed in this Handbook for projects marked as available for Masters. Students should meet with the supervisor/s to discuss the project further. Projects available for 2025 are also listed on the Murdoch Childrens Research Institute and Department of Paediatrics websites.