2017-18 UQ Summer Projects at Mater Research

Project title:	**The expression of alcohol dehydrogenase in the human placenta**
Project duration:	6 weeks
Description:	Alcohol is one maternal insult known to affect fetal growth and development, impacting upon fetal lifelong health. Alcohol consumption during early pregnancy may alter the HPA axis and expose the fetus to excess glucocorticoids resulting in many adverse effects including risk of metabolic disease and restricted growth. Many of the current finding associated with the impact of alcohol consumption on the fetus and placenta have been conducted in animal studies but we want to know if we can detect changes in human placenta based on maternal report of alcohol consumption in the peri-conceptional period. Alcohol dehydrogenase is involved in the metabolism of alcohol and is expressed in the human placenta. *The aim of the current study is to measure alcohol dehydrogenase mRNA expression in placentae from pregnancies where mothers either consumed or did not consume alcohol in early pregnancy.*
Expected outcomes and deliverables:	This project will allow students to be part of a research team and gain some skills in laboratory techniques especially in relation to quantitative PCR. The data will then be analysed in relation to subject characteristics and students will gain some expertise in basic statistical methods. The work will help our team determine whether placental function changes with maternal consumption of alcohol in pregnancy and if we can identify it through changes in the expression of this enzyme.
Suitable for:	Students with a undergraduate biomedical background are encouraged to apply
Primary Supervisor:	A/Prof Vicki Clifton
Further info:	Please contact Vicki Clifton via vicki.clifton@mater.uq.edu.au

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MHS-805-06510

Project title:	**Interventions to improve influenza vaccination rates among high risk groups: A Systematic Review and Meta-Analysis**
Project duration:	6 weeks @29 hours/week
Description:	Influenza is a vaccine preventable cause of morbidity and mortality. Australian guidelines recommend routine vaccinations for all people aged greater than 6 months, and particularly for adults aged >65 years, pregnant women, people with Down syndrome, people with chronic disease, and people who are immunocompromised. *The aim of this project is to complete a systematic review and meta-analysis of the effectiveness of interventions to improve the update of influenza vaccination among community dwelling adults at high risk of influenza.*
Expected outcomes and deliverables:	The opportunity to be part of quantitative research project, conducting a meta-analysis and preparing a paper for publication
Suitable for:	Medical students with experience in quantitative research. Previous experience conducting systematic reviews involving meta-analysis preferred.
Primary Supervisor:	Robert Ware and Lyn McPherson.
Further info:	Please contact Lyn McPherson if you would like to know more about this project before applying. Telephone: 07 3163 8267 Email: l.mcpherson@uq.edu.au Queensland Centre for Intellectual and Developmental Disability (QCIDD) Level 2 Aubigny Place Mater Hospital, South Brisbane

Project title:	The NDIS application process for people with intellectual and developmental disability
Project duration:	8-10 weeks @29 hours/week
Description:	The National Disability Scheme (NDIS) is a new jointly funded programme which largely replaces existing disability support services provided by the Commonwealth and the States. Eligible participants will have a disability support plan developed for them by a new national agency, the National Disability Insurance Agency (NDIA), which is intended to meet their current and future support needs. Packages under the NDIS arrangements are based on a concept of what is 'reasonable and necessary' for an individual client. Participant's needs are assessed and tailored service packages developed and funded for them. From 1 January 2016, early transition to the NDIS has been available in the Local Government Areas of Townsville City and Charters Towers Regional. The roll-out across Queensland is continuing and is scheduled to be complete by July 2019 when it should become available in Moreton Bay, Sunshine Coast, Noosa and Gympie. The individual and their family are required to identify their needs and apply for funding to meet those needs with or without an intermediary. The potential participant may be asked to provide evidence that they have or are likely to have a permanent disability and provide an indication of the level and frequency of support. Some individuals and families will be more skilled at advocating for themselves and their family members than others. People with intellectual disability, autism or low literacy levels are likely to be particularly disadvantaged. *This project will explore the experiences of families in the lead up to the NDIS in Queensland. It will be informed by a review of the literature, including the relevant grey literature that has been published to date. Interviews will be conducted with families to determine the level and nature of support they have received to prepare their application and their expectations that NDIS funding will meet their needs. These interviews will be transcribed and subsequently analysed to identify common themes.*
Expected outcomes and deliverables:	A literature review on the progress of the NDIS roll-out in Australia. Preparation of study Research Plan, Information and Consent Forms and Ethics Application, recruitment of study participants. Interviews will be conducted, transcribed and analysed if time is available.
Suitable for:	A student from a social work or human services area who has a strong interest in disability. Experience in the disability field would be preferred.
Primary Supervisor:	Anna Urbanowicz and Lyn McPherson.
Further info:	Please contact Lyn if you would like to know more about this project before applying. Telephone: 07 3163 8267 Email: l.mcpherson@uq.edu.au Queensland Centre for Intellectual and Developmental Disability (QCIDD) Level 2 Aubigny Place Mater Hospital, South Brisbane

Project title:	Students as Partners - Developing a UQ MD learning module in intellectual and developmental disability
Project duration:	6-8 weeks @29 hours/week
Description:	The Queensland Centre of Intellectual and Developmental Disability (QCIDD) is Collaborating with Professor Nicholas Hawkins, Director of the Office of Medical Education, within the Faculty of Medicine at the University of Queensland to develop some learning modules on intellectual and developmental disability using the "Students as Partners" model. Prof. Hawkins has been working with medical students to develop modules for medical students using the Smartsparrow platform, delivered by Blackboard. QCIDD has much experience in the development of on-line course material, for practitioners, support workers and people with disabilities and their families. *We would like to work with an MD student to develop an accessible web module for the MD program on a topic relating to the medical care of people with intellectual and developmental disability.*
Expected outcomes and deliverables:	An on-line learning module on an intellectual and developmental disability topic.
Suitable for:	MD students.
Primary Supervisor:	Anna Urbanowicz, Miriam Taylor and Lyn McPherson.
Further info:	Please contact Lyn if you would like to know more about this project before applying. Telephone: 3163 8267 Email: l.mcpherson@uq.edu.au Queensland Centre for Intellectual and Developmental Disability (QCIDD) Level 2 Aubigny Place Mater Hospital, South Brisbane

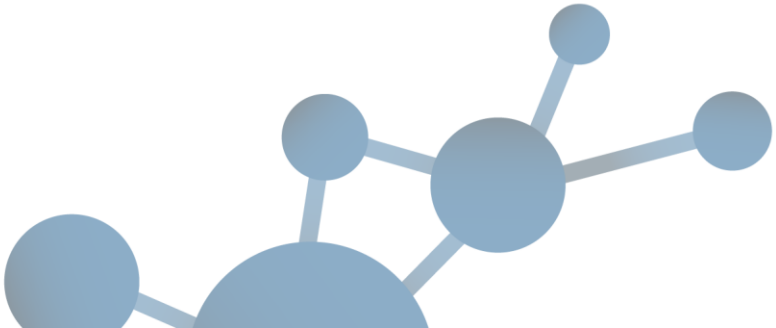
Project title:	Maternal and perinatal factors predicting adverse neonatal outcomes
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. *Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.*
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit an application.

Project title:	The relationship between antenatal feto-placental Doppler indices and perinatal outcome.
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. *Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings*.
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute- University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Sailesh Kumar for an informal discussion before you submit the application.

Project title:	The utility of the cerebroplacental ratio and uterine artery Doppler indices at 24 weeks as predictors of perinatal death.
Project duration:	*4-6 weeks*
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. *Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.*
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit your application

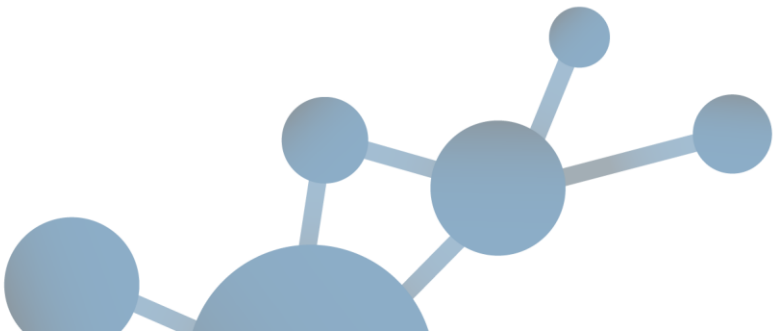
Project title:	The use of placental biomarkers for the prediction of adverse pregnancy outcomes.
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. *Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.*
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit your application.

Project title:	Perinatal outcomes of fetuses with anterior abdominal wall defects
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit your application



Project title:	The relationship between the fetal cerebro-placental ratio measured prenatally and perinatal outcomes.
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Profession Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: Sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit an application

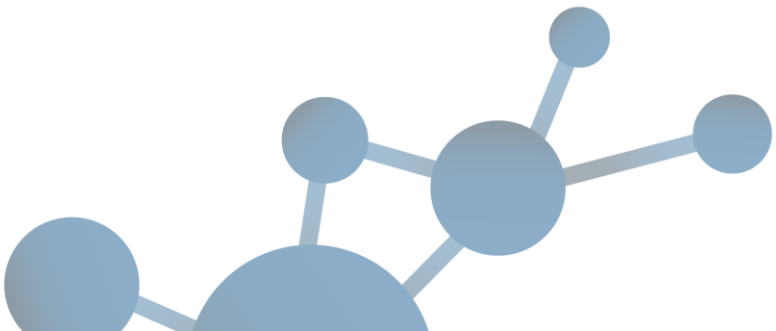
Project title:	Antenatal predictors of poor neonatal GIT motility and feeding in foetuses with gastrochisis
Project duration:	4-6 weeks
Expected outcomes and deliverables:	Students will gain experience in data analysis using a large perinatal data collection from the Mater Clinical Data Research Repository (almost 180,000 births). Assistance from the Mater Research biostatistics and epidemiology team will be provided. HREC approval has already been granted for these studies. *Students will be expected to generate **at least one first author publication** from the data analyses as well as present their findings at local, national and if appropriate international meetings.*
Suitable for:	This project is suitable for undergraduate or postgraduate students with a background in medicine or science, biostatistics, epidemiology or public health with a strong interest in perinatal medicine.
Primary Supervisor:	Professor Sailesh Kumar Mater Research Institute-University of Queensland
Further info:	Professor Sailesh Kumar Email: sailesh.kumar@mater.uq.edu.au Please contact Professor Kumar for an informal discussion before you submit an application



Project title:	Preventing stillbirth and other adverse pregnancy outcomes
Project duration:	Approximately 4-6 weeks – negotiable and flexible
Location	NHMRC Centre of Research Excellence in Stillbirth Mater Research Institute-The University of Queensland (MRI-UQ) Aubigny Place Raymond Terrace, South Brisbane
Description:	Stillbirth (>20 weeks' gestation) occurs in 1 in every 130 pregnancies, and is a devastating event for families, with long-term social and psychological consequences. The Stillbirth Research Team at MRI-UQ conducts a suite of research projects and initiatives to generate evidence and to implement evidence into practice to improve the health of pregnant women and their babies. These projects include but are not limited to: - *The My Baby's Movements Trial:* A trial of a mobile phone app and SMS program to increase pregnant women's awareness of fetal movements; - *Stillbirth research priority setting in Australia:* Developing a consensus on what are the critical areas of focus to address stillbirth prevention and care in Australia. - *Synthesis of the evidence (including meta-analysis) to inform guideline development and future research:* Topics include stillbirth investigations; risk factors and timing of birth; methodologies for identifying substandard care in perinatal mortality; optimal care after stillbirth; and placental biomarkers. - *E-learning portal for obstetricians and midwives:* A suite of online education programs to improve care for women during pregnancy, labour and birth, as well as the management of perinatal deaths. - *Cochrane systematic reviews of perinatal health-related interventions*
Expected outcomes and deliverables:	Scholars may gain skills in data collection, analysis, and report writing, as well as experience working in a multidisciplinary team of obstetricians, neonatologists, midwives, epidemiologists, psychologists, researchers and others. Scholars will have the opportunity to generate publications from their research.
Suitable for:	Senior undergraduate students (years 3 or 4) or postgraduate students with a background in Medicine, Health Psychology, Public Health or Science and who wish to gain research experience to pursue work at least partially or fully in an academic setting. Proficiency in Word and Excel and experience with Endnote is required.
Primary Supervisor:	Prof Vicki Flenady, Dr Hanna Reinebrant
Further info:	Please contact Dr Hanna Reinebrant via email hanna.reinebrant@mater.uq.edu.au if you would like more information before applying.

Project title:	Mitochondrial dysfunction as a predictor of kidney disease in young people with T1D.
Project duration:	8 weeks
Description:	***Rationale:*** Diabetic individuals with kidney disease make up the greatest proportion of persons requiring a kidney transplant or dialysis in Australia. We therefore need to find early detection markers as well as develop a better understanding of why diabetic kidney disease occurs to design more effective treatments. In type 1 diabetes, it has recently been established that kidney disease develops much earlier in life than previously thought and that changes are already evident in adolescents and young adults.It is also understood, that maintaining the function of our cell power stations, the mitochondria, is important for kidney function, since kidneys have a very high demand for energy production from fuel sources such as sugars, lactate and simple fats. In diabetes, this fuel balance is thought to be interrupted which may cause damage to kidneys. This damage includes the loss of important live kidney epithelial cells into the urine through their accidental 'sloughing off" following their detachment from their basement membranes, most likely due to mitochondrial dysfunction. The progressive loss of kidney tissue is characteristic of the development of chronic kidney disease. Live kidney epithelial cells are rarely present in healthy individuals. We are analysing samples and data from a clinical cross-sectional cohort which we recruited at the Mater Young Adult Health Centre. The collection of this cohort study was funded by a DiaComp pilot and feasibility grant from the NIH/NIDDK (USA). This includes clinical characteristics, assays assessing mitochondrial funtion and bipmakers of kidney function. ***Hypothesis:*** **Mitochondrial dysfunction identifies a group of patients with T1D at risk of kidney disease** ***Aim:*** To collate and perform multivariate analyses using "R" on data collected as part of a cohort study in adolescents and young adults with Type 1 diabetes.
Expected outcomes and deliverables:	The applicant will increase their understand of the clinical characteristics of adolescents and young adults with type 1 diabetes from a real world clinic. They will also be trained to use the "R" statistical program and to sort and critically analyse data obtained from a clinical cohort study.

Suitable for:	An interest in diabetes and a reasonable level of computer competence is required.
Primary Supervisor:	Professor Josephine Forbes
Further info:	Please contact Professor Josephine Forbes via email josephine.forbes@mater.uq.edu.au if you would like more information before applying.



Project title:	Unravelling the role of abnormal glycogen accumulation in diabetic kidney disease
Project duration:	6 or 8 weeks.
Description:	**Background:** While it has been reported that an accumulation of kidney glycogen occurs in type 2 diabetes, the metabolic significance of this remains unclear. Given the dramatic deviation from the very low kidney-glycogen content seen in a normal kidney, uncovering the underlying cause of this accumulation and exploring its consequences may uncover novel clinical targets for the treatment of diabetic kidney disease. **Hypothesis:** Glycogen accumulation in type 2 diabetes disrupts normal mitochondrial function in the kidney. **Approach:** Kidney cells will be cultured in normal and high glucose media, as glycogen has been reported to accumulate when exposed to high glucose. SEAHORSE experiments will be used to test the mitochondrial function of cells, including the effect of glucose/glycogen lowering drugs.
Expected outcomes and deliverables:	Applicant will gain experience in preparing cell cultures, as well as learning how to carry out the cutting edge SEAHORSE assay. This will help the applicant gain not only valuable laboratory experience but also a greater understanding of mitochondrial function and kidney metabolism. Co-authorship on a publication is also likely, if the experiments are successfully executed. An oral presentation to our research team describing the experiments and results will be encouraged.
Suitable for:	A student who is keen to learn new skills in the laboratory and who will take a personal interest in the project. A student who has studied courses in biology or biochemistry, with some practical component to the courses would be most suited.
Primary Supervisor:	Professor Josephine Forbes (primary supervisor) and Dr. Mitchell Sullivan
Further info:	Please contact josephine.forbes@mater.uq.edu.au or m.sullivan7@uq.edu.au for more information

Project title:	Measuring Hepatitis B prophylaxis for newborns born to Hepatitis B positive mothers prior to Hospital Discharge**: a data linkage study**
Project duration:	6 weeks @29 hours/week
Description:	Hepatitis B virus (HBV) causes an acute and chronic liver disease. HBV is found in the blood and certain body fluids (such as serum, semen, saliva, and vaginal secretions) of people infected with the virus. An infected mother can transmit HBV to her baby at birth. An infant can also acquire HBV from a chronically infected member of their household. Post-exposure prophylaxis of newborns born to chronically infected mothers is 85%–95% effective when administered within 12 hours of birth. Prophylaxis consists of hepatitis B vaccine and/or hepatitis B immune globulin. Hepatitis B vaccine alone starting at birth will prevent transmission of the virus in 70%–95% of infants born to chronically infected mothers. The aim of this project is to use routinely collected Queensland Health data to investigate how effective the delivery of birth-dose HBV prophylaxis is to infants born to Hepatitis B carrier mothers. Additionally we will investigate coverage and timeliness of the primary course of hepatitis B vaccination in these infants.
Expected outcomes and deliverables:	The opportunity to be part of quantitative research project, including complicated data analyses.
Suitable for:	Students enrolled in health related courses e.g. medicine, with some experience of gastroenterology. Experience in manipulation and analysis of large data sets is essential.
Primary Supervisor:	Robert Ware
Further info:	Please contact Robert Ware via email R.Ware@uq.edu.au if you would like to know more about this project before applying.