GRANTS FUNDING TO COMMENCE IN 2016

The Channel 7 Children's Research Foundation is pleased to announce the grants funding for 2016. In total, $1,367,920 has been committed to fund 21 separate projects, listed in alphabetical order by Institution.

FLINDERS UNIVERSITY

CHIEF INVESTIGATOR: Dr Dani-Louise Dixon

FUNDING AMOUNT: $75,000

PROJECT TITLE: Neutrophil polarisation in the airways of infants hospitalised with bronchiolitis

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Clinical Study

SIGNIFICANCE: Bronchiolitis is the most common severe respiratory tract illness in infants and remains a major cause of infant hospitalisation. Apart from supportive intervention there is no treatment. Bronchiolitis is predominantly caused by viral infections that induce immune cells (neutrophils) to damage the lung, increasing severity and leading to chronic wheeze in up to 50% of patients. Our lab demonstrated that decreased neutrophil prevalence in the airways is associated with decreased severity of bronchiolitis. However new research suggests that neutrophil type may be as important as absolute number.

CHIEF INVESTIGATOR: Associate Professor Anthea Magarey

FUNDING AMOUNT: $75,000

PROJECT TITLE: On-line and in control: PEACHTM (Parenting, Eating and Activity for Child Health) Lifestyle

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Community Based Study

SIGNIFICANCE: Childhood obesity is a global problem with little evidence to inform practice. Our PEACHTM RCT program is one of few programs to demonstrate effectiveness and has been translated to community settings in SA and QLD. The program targets parents of overweight primary schoolers, taking a family-focussed approach to improve lifestyles and weight status. Recruitment is difficult due to sensitivity of the issue and poor recognition of the problem; retention is challenged by the need for long term support. The proposed program will address these issues to improve children's health, state-wide.

HANSON INSTITUTE

CHIEF INVESTIGATOR: Professor Sandra Hodge

FUNDING AMOUNT: $75,000

PROJECT TITLE: Studies into the mechanisms that progress protracted bacterial bronchitis to bronchiectasis in children, and therapeutic targeting of these processes

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Inadequate diagnosis and treatment of recurrent Protracted Bacterial Bronchitis (PBB) may lead to reduced lung function and lower life-expectancy. We have found defective airway macrophage phagocytic function in these children that may contribute to a progression of PBB to bronchiectasis. We also found that the macrophage dysfunction in adults with chronic lung disease is associated with sphingosine signalling and that this system is a therapeutic target for FTY720 and macrolide antibiotics. Translating this data to the paediatric setting has a high likelihood of identifying new therapies.

MENZIES SCHOOL OF HEALTH RESEARCH

CHIEF INVESTIGATOR: Dr Angela Titmuss

FUNDING AMOUNT: $35,000 **EARLY CAREER GRANT**

PROJECT TITLE: PANDORA Cohort Wave 1 - assessment of the impact of maternal diabetes on child development

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Clinical Study

SIGNIFICANCE: This project explores the child health consequences of Type 2 Diabetes in pregnancy and gestational diabetes mellitus, in the context of a diabetes epidemic in the Indigenous population. This will inform design of future interventions to prevent the intergenerational cycle of disease within this high risk population. The project will examine the health and developmental outcomes of 18 to 42 month old Indigenous and non-Indigenous children, born to mothers with and without diabetes in pregnancy (DIP).

NOVITA CHILDREN'S SERVICES

CHIEF INVESTIGATOR: Ms Kerry Evans

FUNDING AMOUNT: $74,920

PROJECT TITLE: A randomised controlled trial on the impact of the Paediatric WalkAide (a drop-foot stimulator) on advanced motor skills and physical activity participation in children with hemiplegic cerebral palsy

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Clinical Study

SIGNIFICANCE: Children with hemiplegic cerebral palsy (CP) often have ankle control issues in one leg, with weakness/spasticity that causes trips/falls due to poor foot clearance when moving quickly. Many wear an ankle brace to stop their foot dragging. However, this blocks ankle motion and affects speed/performance during physical activity (PA). WalkAide is a device worn around a child's calf. It activates muscles to enable the ankle to move with optimal positioning. Early research shows WalkAide promotes better walking. This study will determine the impact on advanced motor skills and PA participation.

THE UNIVERSITY OF ADELAIDE

CHIEF INVESTIGATOR: Dr Prabha Andraweera

FUNDING AMOUNT: $35,000 **EARLY CAREER GRANT**

PROJECT TITLE: Genetic and early life determinants of childhood obesity

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Clinical Study

SIGNIFICANCE: 25% of South Australian 4 year olds are obese. Obesity places a child at increased risk of childhood morbidity and a variety of adult onset diseases. Genetic factors and intrauterine life contribute to risk of childhood obesity. We will use the detailed demographic, clinical, lifestyle, and genetic data from the SCOPE study to identify antenatal determinants of obesity in the children at age 10. This study will provide novel insights into early origins of obesity that may lead to early life interventions to prevent childhood obesity.

CHIEF INVESTIGATOR: Dr Bart Eijkelkamp

FUNDING AMOUNT: $35,000 **EARLY CAREER GRANT**

PROJECT TITLE: Optimal dietary metal ion uptake and its role in protection against childhood bacterial disease

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Nearly 2 billion people worldwide have a poor zinc status and in the Western world childhood zinc deficiency is on the increase due to unhealthy diets and obesity. The immune system utilizes zinc and copper as antimicrobials to combat infectious diseases. This places children with a poor zinc status at increased risk of infections by widely abundant childhood respiratory pathogens such as Streptococcus pneumoniae. Although zinc deficiency has previously been associated with increased disease burden, the role of zinc and copper as antimicrobials during infection remains unknown.

CHIEF INVESTIGATOR: Associate Professor Toby Hughes

FUNDING AMOUNT: $75,000

PROJECT TITLE: Childhood oral health and disease - a multifactorial model

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Tooth decay is the most common chronic disease of Australian children, affecting 50% of 6 year olds. It causes pain, systemic infection, speech/learning problems, and is a predictor for poor general health. Treatment accounts for $5.3 billion in spending in Australia annually.

The role of dietary sugar in tooth decay is well established, however population lifestyle changes are difficult and costly to implement. This project will identify factors in dental plaque for use in early screening to identify high risk children, promoting targeted, less invasive, and more cost-effective interventions.

CHIEF INVESTIGATOR: Dr James Hughes

FUNDING AMOUNT: $75,000

PROJECT TITLE: Identifying the pathological mechanism of childhood epilepsy and adolescent movement disorders caused by PRRT2 mutations

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Epilepsy and movement disorders are highly debilitating conditions that together affect approximately 3% of individuals at some stage during life. Although many forms are inherited, the disease-causing gene is usually not known. We have recently solved a long standing mystery in this field, identifying that changes in the PRRT2 gene cause childhood seizures, migraine and movement disorders. The aim of this project is to understand how genetic changes in PRRT2 affect brain activity using neuronal and behavioral analyses of a mouse model of PRRT2-disease.

CHIEF INVESTIGATOR:	Professor Michael Sawyer
FUNDING AMOUNT:	$75,000
PROJECT TITLE:	A randomised controlled trial evaluating the effectiveness of a nurse-moderated group-based internet support program for mothers with comorbid mild to moderate depression and parenting problems
PROJECT DURATION:	2 Years
RESEARCH CATEGORY:	Community Based Study
SIGNIFICANCE:	This study will utilise a randomised controlled trial to determine whether a 4-month nurse-supported, group-based intervention delivered via the internet when infants are 2-6 months, reduces levels of maternal depressive symptoms and improves the quality of maternal caregiving when infants are aged 2-12 months. The intervention provides easy access for new mothers to both professional and peer support during the immediate postnatal period. These are the two key elements of support that new mothers seek during this period of time.

CHIEF INVESTIGATOR:	Associate Professor Cheryl Shoubridge
FUNDING AMOUNT:	$65,000
PROJECT TITLE:	Investigating how mutations in IQSEC2 cause intellectual disability and severe early onset seizures in children using a mouse modelling the knockout of Iqsec2.
PROJECT DURATION:	1 Year
RESEARCH CATEGORY:	Basic Science
SIGNIFICANCE:	Intellectual disability (ID) is frequent in the population with as many as 1 in every 50 people affected. The cost to Australia of ID is estimated at $14 billion annually. Children that have mutations in the IQSEC2 gene have substantial limitations in intellectual functioning and present with autistic traits and early onset seizures. We have generated a novel mouse model with complete knockout of Iqsec2. Our study will harness this powerful resource to investigate the role of this intellectual disability gene on the development and function of the brain at the cellular and molecular level.

UNIVERSITY OF SOUTH AUSTRALIA

CHIEF INVESTIGATOR:	Professor Allison Cowin
FUNDING AMOUNT:	$65,000
PROJECT TITLE:	Reducing inflammation to improve burn injury repair
PROJECT DURATION:	1 Year
RESEARCH CATEGORY:	Basic Science
SIGNIFICANCE:	Burns are one of the most common injuries in young children. They cause lifelong scarring and frequently contract as the child gets older, requiring extensive surgical intervention to prevent deformity and contracture. Inflammation is a fundamental component of wound healing, however, excessive inflammation is detrimental and leads to fibrosis and scarring. Therapies currently exist to dampen inflammation in other diseases. Since inflammation plays such a significant role in fibrosis and scarring the use of these existing therapies could rapidly lead to new therapeutic approaches for burns.

CHIEF INVESTIGATOR:	Associate Professor Leanne Dibbens
FUNDING AMOUNT:	$70,000
PROJECT TITLE:	Exploring the role of DEPDC5 mutations in childhood brain abnormalities
PROJECT DURATION:	1 Year
RESEARCH CATEGORY:	Basic Science
SIGNIFICANCE:	We will determine if mutations in the DEPDC5 gene are responsible for some defects in child brain development. We recently discovered DEPDC5 mutations cause familial focal epilepsy (inherited). Some patients with earlier age of seizure onset (1-7yrs) have visible brain malformations and intellectual disability and/or autism spectrum disorder. Because DEPDC5 negatively regulates cell growth and metabolism these brain lesions may be due to abnormal growth and metabolism of brain cells. If we can establish this is the case, drugs exist that could treat these children and may prevent some symptoms

CHIEF INVESTIGATOR:	Associate Professor Leanne Dibbens
FUNDING AMOUNT:	$70,000
PROJECT TITLE:	Understanding the genetics of childhood diseases with Next Generation Sequencing
PROJECT DURATION:	1 Year
RESEARCH CATEGORY:	Basic Science
SIGNIFICANCE:	The majority of childhood diseases do not receive a specific molecular diagnosis. By utilizing the latest in Next Generation DNA Sequencing technologies we can change this. We can now relatively rapidly sequence affected children as well as their affected /unaffected parents and relatives to hunt down the gene(s) causing the disease. This can now be achieved in a few months instead of many years. We will study difficult to solve childhood patients with Neurological disorders referred to us by the Women's and Children's Hospital in Adelaide.

CHIEF INVESTIGATOR:	Associate Professor Michele Grimbaldeston
FUNDING AMOUNT:	$70,000
PROJECT TITLE:	Novel approaches to control mast cell function.
PROJECT DURATION:	1 Year
RESEARCH CATEGORY:	Basic Science
SIGNIFICANCE:	Allergic disorders, such as asthma, anaphylaxis and atopic dermatitis, remain major health problems in need of better long term management. Currently, approx. 4.1 million Australians are afflicted with disease onset commonly present in children and adolescents. Allergic inflammation can be driven by activated mast cells and we have discovered that a family of proteins, IL-3/IL-5/GM-CSF, present in allergic inflammation can amplify the magnitude of mast cell responses, and that such elevated responses can be combated using our unique human IL-3 receptor blocking antibodies we have developed.

CHIEF INVESTIGATOR: Dr Sarah Heron

FUNDING AMOUNT: $75,000

PROJECT TITLE: Understanding the contribution of parental mosaicism to the causes of childhood genetic epilepsies.

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: This project will help to accurately define the frequency of somatic mosaicism, that is, the presence of a mutation in only some of the cells in the body, in three genes causing childhood epilepsies (SCN1A, KCNT1 and DEPDC5). Somatic mosaicism can lead to the birth of multiple children with a genetic disorder, even if the parents are unaffected, but is not readily detectable. The data to be gained from this study will improve genetic counselling for affected families by enabling more accurate prediction of the risk of the birth of another affected child.

CHIEF INVESTIGATOR: Professor Shudong Wang

FUNDING AMOUNT: $75,000

PROJECT TITLE: New treatment for childhood leukaemia

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Mixed lineage leukaemia (MLL) is the most aggressive blood cancer in infants and paediatric patients. No effective treatment is available to patients affecting by the disease. MLL is characterized by the presence of multiple fusion proteins that stimulate transcriptional elongation of MLL related leukemic genes. Cyclin-dependent kinase 9 (CDK9) controls the transcriptional elongation. Blocking CDK9 activity by our innovative CDK9 inhibitor induces MLL cells death. This project offers a CDK9 inhibitor drug candidate as a new, effective and safe treatment for childhood leukaemia.

CHIEF INVESTIGATOR: Dr Sophie Wiszniak

FUNDING AMOUNT: $35,000 **EARLY CAREER GRANT**

PROJECT TITLE: Investigating causes of congenital heart disease using a mouse model with great artery and cardiac outflow tract defects

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Eight babies are born with a heart defect everyday in Australia, which equates to 1% of all births, and is the leading cause of infant mortality and morbidity. We have recently discovered cardiac outflow tract, great artery, arterial valve and ventricular septum defects in Nedd4 knockout mice, which are reminiscent of the congenital heart defects seen in children. This mouse model will help us to understand the mechanistic processes controlling heart development, with the aim to improve diagnosis and provide new therapies for these highly prevalent disorders.

CHIEF INVESTIGATOR: Professor Cory Xian

FUNDING AMOUNT: $75,000

PROJECT TITLE: Preventing childhood methotrexate chemotherapy-induced bone loss by blocking the aggravated pro-osteoclastogenic cytokine - NF-kB signalling

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Whilst chemotherapy of major childhood cancers has a 75% cure rate, it causes chronic bone loss and higher fracture risks. Recently in rats treated with methotrexate (MTX, most commonly used in childhood oncology and bone marrow transplants), we observed more bone-resorptive cells engaging in bone resorption which is due to increased activation of transcription factor NF-kB signalling. Here we examine bone protective effects of a natural NF-kB inhibitor in our MTX model. This work will potentially lead to a preventative strategy for ensuring bone health for children during and after MTX chemo.

WOMEN'S & CHILDREN'S HEALTH RESEARCH INSTITUTE

CHIEF INVESTIGATOR: Dr Cheryl Brown

FUNDING AMOUNT: $68,000

PROJECT TITLE: PI16-CD26 interaction: A new mechanism for immune tolerance in humans?

PROJECT DURATION: 1 Year

RESEARCH CATEGORY: Basic Science

SIGNIFICANCE: Specialised cells called regulatory T cells, or Tregs, are the policemen of the immune system, and are essential for a balanced healthy immune response. However, in type 1 diabetes, there is a breakdown in function of Treg, leading to the onset of autoimmune disease. We have discovered a new molecule called PI16, and we are investigating a new mechanism by which PI16 regulates immune responses in healthy children, but which is altered in type 1 diabetes

WOMEN'S AND CHILDREN'S HOSPITAL

CHIEF INVESTIGATOR: Dr Paul Henning

FUNDING AMOUNT: $70,000

PROJECT TITLE: Immune Monitoring in Renal Transplantation

PROJECT DURATION: 2 Years

RESEARCH CATEGORY: Clinical Study

SIGNIFICANCE: Renal transplantation is the optimum treatment for children with kidney failure. Unfortunately transplant requires lifelong immune system suppression, and hence, the risk of life-threatening infections and cancer. Reducing immunosuppression to avoid these outcomes may result in kidney rejection and transplant loss. This research will explore a number of innovative immune system markers permitting fine-tuning of immune suppression treatment, such that the fine balance between over- and under-immunosuppression can be achieved, and survival of children with renal failure can be maximised.