Investigators and Projects Directory as of January 2024

This paper summarises Luminesce Alliance projects, lead investigators (**) and investigators directly involved in 2023-2027 Enabling Platforms Program and 2019-2023 Paediatric Precision Medicine Program.

To establish whether your organisation's projects or investigators are supported by Luminesce Alliance, the document may be searched via the investigator's name, or the organisation's acronym: SCHN (Sydney Children's Hospitals Network); CCI (Children's Cancer Institute), CMRI (Children's Medical Research Institute), USYD (University of Sydney), UNSW (University of NSW).

Please also refer to the most recent Impact for Children's Health Report 2022-2023 which highlights achievements to date.

Both programs have and continue to fund additional personnel not listed in the tables below. For instance, the PPM program funded over 140 clinicians, researchers, and other healthcare professionals across all five LA partners, as well as collaborators from other universities, health, and medical research institutions; and supported over 20 PhD students and Masters students.

For more information: info@luminesce.org.au or contact Sue Corlette, Communications & Marketing Manager 0412 025 278

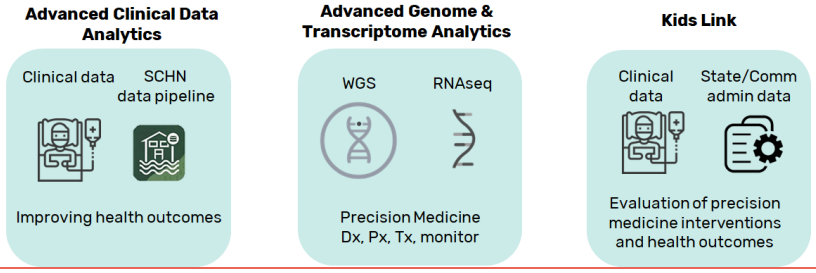
2023-2027 Enabling Platforms Program

Functional Genomics Enabling Platform This platform studies how genes and the DNA between genes contribute to different biological processes and cause disease. It offers two platforms one focusing on rare diseases and the other on translational tumour biology.	
Functional Genomics Rare diseases This platform will build new research capacity across stem cell medicine and vectorology that will support 4 research streams across: Inherited retinal disorders and vision impairment; Neurodevelopmental disorders; Telomere disorders - haematological diseases and bone marrow failure.	
Prof Patrick Tam** CMRI **Associate Prof Anai Gonzalez Cordero** CMRI **Associate Prof Leszek Lisowski** CMRI **Associate Prof Wendy Gold** SCHN/CMRI **Prof Ian Alexander** CMRI **Prof Robyn Jamieson** CMRI **Dr Mark Graham** CMRI **Associate Prof Pengyi Yang** CMRI **Prof Tracy Bryan** CMRI **Associate Prof Karen McKenzie** CMRI	PTam@cmri.org.au
Translational tumour biology* This platform provides will provide a new functional genomics methodology to address paediatric cancers, particularly high-risk, refractory, or relapsed cancers, using core technology called Cas13 – which is a way to directly disrupt the expression of genes in cancer cells without altering the underlying genome.and will lead to drug discovery and clinical trials.	

Associate Prof Paul Ekert CCIA** **Dr Mohamed Fareh** CCI **Dr Antoine de Weck** CCI **Prof Ian Street** CCI	PEkert@ccia.org.au

Data Enabling Platform

The program is about translating rich and complex data into new treatments, new prevention strategies and clinical impact. It offers 3 platforms outlined below.



Advanced Clinical Data Analytics

This platform stream aims to optimise the use of clinical data by enabling capacity for clinical analytics at Sydney Children's Hospitals Network within existing platforms under a coordinated strategy to support management of lower respiratory tract infections, management of cystic fibrosis, and ascertainment of clinical data relevant to children with cancer (diagnosis, imaging, treatments, outcomes).

Prof Tom Snelling USYD**	tom.snelling@sydney.edu.au
Ms Grace Currie USYD	grace.currie@sydney.edu.au
Daniela Vargas USYD	daniela.vargas@sydney.edu.au

Advanced Genome and Transcriptome Analytics

This platform stream aims to develop an advanced molecular profiling analysis platform with novel methods and evaluate whether these improve the rates of diagnosis and treatment recommendations in cancer and rare diseases.

Associate Prof Mark Cowley CCIA**	mcowley@ccia.org.au
Julian Quinn CCIA	jquinn@ccia.org.au

Kids Link

This platform will harness data linkage by sourcing clinical, genomic, and administrative health, treatment, and observational data to identify determinants of disease, assess effective treatment, pathways of health care, and associated health outcomes, and identify effective clinical interventions and therapies. It will focus on inflammatory markers in pregnancy and impact on child neurodevelopmental disorders; rare genetic diseases such as Duchenne muscular dystrophy, and inborn errors of metabolism); evaluate new therapies for childhood cancer on long-term child health/development; evaluate the PEACH-E (Providing Enhanced Access to Child Health Services Evaluation program) on child health and health services

Prof Natasha Nassar USYD**	natasha.nassar@sydney.edu.au

Amanda Poomcharoenwattana USYD	amanda.poomcharoenwattana@sydney.edu.au

Precision Therapy Enabling Platform

Bringing together a uniquely skilled workforce to create a pipeline platform that bridges the gap between disease biology and the development for new drug candidates for paediatric diseases.

The program offers two platforms KAT and THINK.

Total Funding $4,262,000

Kids Advanced Therapeutics (KAT)

The KAT clinical trials program facilitates translation of clinical trials into clinical care. The program will initiate transformative Phase I/II clinical program trials to target diseases including liver diseases, blinding eye diseases and neurodevelopmental disorders.

Ms Lani Attwood SCHN **	Lani.Attwood@health.nsw.gov.au
Dr Michelle Lorentzos SCHN**	michelle.lorentzos@health.nsw.gov.au
Paula Bray SCHN	
Dr Laura Fawcett SCHN	

THINK

Therapeutic INnovations for Kids (THINK) Drug Discovery program focuses on drug discovery by identifying novel and re-purposed therapeutics for childhood cancers, genetic diseases and neurodevelopmental disorders.

Prof Ian Street CCIA**	IStreet@ccia.org.au
Associate Prof Greg Arndt CCI	GArndt@ccia.org.au
Associate Prof Mark Cowley CCIA	
Associate Prof Antoine de Weck CCI	
Associate Prof Paul Ekert CCIA	
Associate Prof Vanessa Tyrrell CCI	
Associate Prof David Ziegler CCI/SCHN	
Prof Robyn Jamieson CMRI	
Prof Russell Dale SCHN	
Associate Prof Michelle Farrar SCHN	
Dr Tim Failes CCI	

Psychosocial Enabling Platform

Development of resources for families; support education and schooling for children having paediatric precision medicine and their siblings; enhance mental health in children and families accessing paediatric precision medicine. **Funding: $2,109,000**	
Dr Kate Hetherington UNSW** **Associate Prof Sue Woolfenden** SCHN **Prof Claire Wakefield** Minderoo Foundation **Dr Joanna Fardell** UNSW **Dr Lauren Kelada** UNSW **Dr Sarah Ellis** UNSW	k.hetherington@unsw.edu.au sarah.ellis@unsw.edu.au l.kelada@unsw.edu.au j.fardell@unsw.edu.au

Health Systems Implementation and Economics (HSIE) Enabling Platform The Providing Enhanced Access to Child Health Services Evaluation (PEACH-E) is an exemplar project for this platform. The PEACH initiative aims to reduce health inequities experienced by children and young people from priority populations at every stage of the patient's journey. Priority populations include patients who identify as Aboriginal and Torres Strait Islander, culturally and linguistically diverse, refugee/asylum seeker, living with a disability, or living in out of home care. The program will provide evidence for implementing new research into the health system and proving its economic value.	
Prof Raghu Lingam UNSW** **Prof Karen Ziwi** SCHN** **Associate Prof Peter Hibbert** Macquarie Uni **Prof Gavin Schwarz** Macquarie Uni **Prof Henry Cutler** Macquarie Uni **Dr Nan Hu** UNSW **Dr Michael Hodgins** UNSW **Dr Rezwanul Rana** UNSW **Dr Melodie Cartel** UNSW **Dr Karen Hutchinson** Macquarie Uni **Prof Faye McMillan** UTS **Dr Smithers-Sheedy** UNSW **Prof Jeffrey Braithwaite** Macquarie Uni **Associate Prof Sue Woolfenden** SCHN **Prof Claire Wakefield** Minderoo Foundation **Prof Natasha Nassar** SCHN/USYD	r.lingam@unsw.edu.au karen.zwi@health.nsw.gov.au peter.hibbert@mq.edu.au g.schwarz@unsw.edu.au henry.cutler@mq.edu.au nan.hu@unsw.edu.au michael.hodgins1@unsw.edu.au rezwanul.rana@mq.edu.au m.cartel@unsw.edu.au karen.hutchinson@mq.edu.au Faye.McMillan@uts.edu.au h.smitherssheedy@unsw.edu.au jeffrey.braithwaite@mq.edu.au susan.woolfenden@health.nsw.gov.au

INFORM2 Clinical Trial INFORM2 Clinical Trial is an exploratory multinational phase I/II combination study of Nivolumab and Entinostat in children and adolescents with brain cancer. The trial aims to increase survival rates with the use of these two immunotherapy agents.	
Associate Prof Vanessa (Ness) Tyrrell CCI**	d.ziegler@unsw.edu.au VTyrrell@ccia.org.au

Associate Prof David Ziegler CCI/SCHN ** [this list may be incomplete] Joice Kuroiwa-Trzmielina Mitali Manzur	

2019-2023 Paediatric Precision Medicine Program

Luminesce Alliance launched the $24M Paediatric Precision Medicine Program in 2019. This program exclusively focused on early diagnosis and treatment for children, limiting long-term effects and reducing the burden on the healthcare system. The program enhanced NSW's capacity and integrated cutting-edge technologies into personalised clinical care as detailed our Impact Report 2022-2023.

Centralised capacity to develop functional genomics for Paediatric Precision Medicine

This program utilised functional genomics to enhance children's screening, diagnosis, and personalised clinical care. It introduced innovative treatments like gene and cell therapies for various conditions, such as inherited retinal diseases, mitochondrial disorders, telomere-related blood disorders, and cancers. It also funded workforce capability; establishment of the Stem Cell and Organoid Facility at CMRI and expanded genome editing capacity through the Vector and Genome Engineering Facility at CMRI.

Lead Investigators

Prof Ian Alexander CMRI
Prof Patrick Tam CMRI
A/Prof Anai Gonzalez- Cordero CMRI
Prof Robyn Jamieson CMRI
Prof Tracy Bryan CMRI
Joshua Studdert CMRI
Dr Leszek Lisowski CMRI
Dr Predrag Kalajdzi CMRI
Prof Chris Cowell (previously SCHN)
Adjunct A/Prof Paula Bray

Cystic Fibrosis Functional Genomics

This program contributed to a new laboratory that is using organoids grown from stem cells to test, identify, and explore the effects of new therapies for cystic fibrosis and repurpose existing therapies, particularly for patients with rare mutations.

Lead Investigators

Prof Adam Jaffe UNSW
Dr Shafagh Waters UNSW

Paediatric Precision Medicine Computational Biology Program

This program assembled Australia's largest paediatric computational biology team to establish a robust data analysis and interpretation platform, vital for advancing precision medicine within our hospitals. It successfully pinpointed novel genes and markers associated with childhood cancer risk, translating these findings into enhanced diagnostic and treatment outcomes for children. With advanced technologies and close collaboration with clinicians, the team was able to identify the genetic roots of cancer in over 90% of cases. These insights have informed new initiatives for disease prevention and early diagnosis including adult cancer and other rare diseases.

Lead Investigators

A/Prof Mark Cowley CCI
A/Prof Vanessa Tyrrell CCI
Dr Marie Wong-Erasmus CCI
Dr Kitty Lo CCI
Dr Mark Pinese CCI
Mr Mustafa Syed CCI
Mrs Chelsea Mayoh CCI
Ms Patricia Sullivan CCI
Ms Sabrina Yan (nee Rispin) CCI
Ms Louise Cui CCI

Paediatric Cancer Predisposition Screening Program

This program saw all children in NSW diagnosed with cancer eligible to participate in a genetic predisposition screening study the PREDICT trial. It allowed for the identification of gene variants of possible clinical significance and identification of families susceptible to the development of cancer and rare diseases. This program has now successfully established the foundation for access to the appropriate services for the management of risk, preventative measures, and treatment for children and families with a genetic predisposition to cancer that has supported the ZERO program.

Lead Investigators

Dr Luciano Dalla Pozza, Head Cancer Centre for Children Children's Hospital at Westmead, SCHN
A/Prof Tracey O'Brien (previously SCHN)
A/Prof Katherine Tucker SCHN
A/Prof Vanessa Tyrrell CCI
A/Prof Mark Cowley CCI
Prof Claire Wakefield SCHN
A/Prof Judy Kirk SCHN
A/Prof Kristine Barlow-Stewart CCI
Dr Yuyan Chen CCI
Dr Noemi Fuentes-Bolanos SCHN
Dr Kate Hetherington SCHN
Dr Joice Kuroiwa-Trzmielina CCI
A/Prof Geraldine O'Neill USYD
Dr Mark Pinese CCI
Dr Bhanva Padhye SCHN
Dr Dianne Sylvester USYD
Ms Abiramy Ragunathan SCHN

Paediatric Rare Diseases Predisposition Screening

This program aimed to streamline the rare diseases diagnostic journey for families through advanced genetic testing. The program, established Gene2Care, to improve the standard of care, including timely and enhanced diagnoses and access to management and treatment. This family-centered program, combined the efforts of Clinical Geneticists and Genetic Counsellors across Sydney Children's Hospitals Network while collaborating with world-leading experts in genomics. The program also incorporated GeneAdd a predisposition screening platform that utilises whole genome sequencing for diagnosing rare diseases in children. Additionally, it included a fellowship program to train young clinicians in interpreting and reporting genomic results, ensuring better understanding and informed management planning.

Lead Investigators

Dr David Mowat SCHN
A/Prof Meredith Wilson (previously SCHN)
A/Prof Kristine Barlow-Stewart UNSW
Dr (Elizabeth) Emma Palmer SCHN
A/Prof Tony Roscioli NSW Health Pathology
Ms Claire Wong SCHN
Dr Kristi Jones SCHN
Dr Janine Smith SCHN
Prof Chris Cowell (previously SCHN)

Translation of Paediatric Precision Medicine - Clinical Trials

This initiative facilitated and expanded the number of paediatric clinical trials in NSW involving novel gene and cell therapies for paediatric patients with rare genetic diseases and cancer. The funding also supported the workforce capacity and capability of clinicians and researchers, the development of trial methodology and protocol design, and formulated an education, implementation, and service model to seamlessly deliver early-phase and innovative trials within the NSW healthcare system, building further capacity across our children's hospitals to deliver clinical trials of precision medicine to patients.

Lead Investigators

Prof Chris Cowell (previously SCHN)
Ms Lani Attwood SCHN
Prof Craig Munns (previously SCHN)
Dr Laura Fawcett SCHN

Paediatric Precision Medicine Integrated Data Linkage System

This program combined genomic and clinical data with administrative health data to understand the causes of rare childhood conditions and inform decision-making for the management and treatment of children to improve their long-term health and well-being, focus areas included cancer, congenital heart conditions, and other rare disease.

Lead Investigators

Prof Natasha Nassar SCHN/USYD
Dr Jane Bell USYD

Economic Impact and Framework for Sustainable Implementation of Paediatric Precision Medicine in the Australian Health System

This project evaluated the implementation and costs of precision medicine through the Zero Childhood Cancer Program (ZERO). The work has demonstrated the cost-effectiveness of a precision medicine program as a new model of care. It has also provided insights into the barriers and facilitators in delivering a precision medicine program of this scale. The health economics and implementation science approaches used were pioneering in the context of paediatric cancer precision medicine in Australia.

Lead Investigators

A/Prof Tracey O'Brien (previously SCHN)
A/Prof Vanessa Tyrrell CCI
Prof Deborah Schofield GenIMPACT
Dr Rupendra Shrestha GenIMPACT
Ms Sarah West GenIMPACT
Dr Melanie Zeppel Macquarie University
Mr Owen Tan GenIMPACT
Prof Jeffery Braithwaite Macquarie University

Dr Jim Smith Macquarie University
Prof Frances Rapport Macquarie University

Blinding Genetic Eye Conditions: Economics and Health Implementation Impacts of Genomics and Precision Medicine

This project marked the first of its kind globally to gather data on the quality of life and health-related costs of inherited eye disease (IRD) in Australia. It found that the cost was $5.2M per person with a significant portion of this financial burden falling on affected individuals and their families, with societal costs (including government support and lost income) accounting for 87% of all costs, while healthcare expenses constitute only 13%. The findings have been published in The Medical Journal of Australia.

Lead Investigators

Prof Robyn Jamieson CMRI

The psychosocial implications of genetic testing and precision medicine for children and their families and the healthcare professionals who care for them.

Genetic testing and precision medicine have the potential to transform childhood chronic illness diagnosis and management.
This program aimed to understand the potential psychological and social consequences of genetic testing and precision medicine on children and families. The insights gained have led to the creation of resources, empowering healthcare providers to offer psychosocial support and assisting families in making decisions about precision medicine trial enrolment. This better understanding of family needs enables healthcare providers to confidently recommend precision medicine and genetic testing to their patients.

Lead Investigators

Prof Claire Wakefield UNSW
Dr Kate Hetherington UNSW
Dr Brittany McGill UNSW
Ms Suzanne Nevin UNSW

Newborn Screening Program Pilot for Spinal Muscular Atrophy and Primary Immunodeficiency in NSWACT

This two-year pilot provided babies born in hospitals across NSW and the ACT are being offered screening for Spinal Muscular Atrophy (SMA), as well as some Primary Immunodeficiencies (PID). This led to the expansion of SMA and inherited immune disorders screening for all babies nationally; and boosted an international gene therapy trial that could potentially reverse the disease. A health economic evaluation and budget impact was conducted instrumental in the national implementation of newborn screening for SMA and in building the case for access to novel new gene therapy, Zolgensma®, and its inclusion on the PBS.

Lead Investigators: A/Prof Michelle Farrar SCHN, A/Prof Veronica Wiley SCHN, Dr Sophy Shih UNSW

Establishment of small-scale cGMP vector manufacturing for gene and cell therapy clinical trials – laying the foundations for national large scale capacity

The initial $2 million in funding for this project provided the groundwork for clinical grade associated viral vector production capability in NSW. It was also instrumental in securing additional leveraged funds to support a gene therapy clinical trial activity at SCHN: $134 million NSW Government. Stage 1 (December 2019) and Stage 2 (announced June 2022) to build and operate a commercial-scale viral vector manufacturing facility at the Westmead Health and Innovation District and accelerate viral and vector projects for research and clinical trials; and $2.3 million MRFF Clinical Trials Activity grant to fund the "The E2CAR Trial – a CAR T-cell trial targeting paediatric sarcoma.

Lead Investigator: Prof Ian Alexander, SCHN, CMRI

INFORM2: An exploratory multinational phase I/II combination study of Nivolumab and Entinostat in children and adolescents with high risk Malignancies

This program funded the INFORM2 (INdividualized Therapy for Relapsed Malignancies in Childhood) trial for children and adolescents dealing with high-risk solid tumours and central nervous system tumours that have relapsed, are refractory, or are progressing. The trial combined with ZERO's molecular screening platform for eligibility assessment, provides Australian children with access to Nivolumab and Entinostat combination therapy as part of this multinational phase I/II clinical trial.

Lead Investigators: A/Prof David Ziegler SCHN, Children's Cancer Institute, Prof Olaf Witt Hopp Children's Cancer Center Heidelberg, A/Prof Vanessa Tyrrell CCI

Paediatric Precision Medicine Program Innovation Projects

A self-amplifying theranostic for treatment of neuroblastoma

The project aims to evaluate the therapeutic efficacy of 177Lu-CDI (radioisotope Lutetium-177 bound to CDI) in unprimed or chemotherapy-primed murine neuroblastoma tumours. The research results have led to significant funding, commercial collaborations and two patent applications. If successful, it could change the paradigm for treating cancers that are hard to reach and treat. The results of the project have also been published in peer-reviewed journal publications and presented at cancer research forums.

Lead Investigator: Prof Phillip Hogg, USYD

Translating disease severity biomarkers into the clinic for Rett syndrome

The research provided preliminary evidence to identify potential biomarkers that may predict therapeutic efficiency in pre-clinical studies for Rett syndrome. The project has led to >$600,000 MRFF grant to develop new treatments and therapies for Rett syndrome.

Lead Investigator: A/Prof Wendy Gold, SCHN

Precision medicine addressing a novel disease pathway to preserve sight in the retinal dystrophies

The project has generated new knowledge on therapeutic pathways for target in the retinal dystrophies. It has also led to capability building by providing unique model systems to test anticipated novel small molecule inhibitors of ALPK1, generated through collaboration with CCI drug development team (THINK).

Lead Investigator: Prof Robyn Jamieson, CMRI

Curing genetic metabolic liver disease by precise genomic and epigenomic editing

This project focused on the rare genetic metabolic liver disease Ornithine transcarbamylase (OTC) the commencement of a collaborative Phase I/II gene therapy clinical trial for OTC deficiency with colleagues in London using a gene addition approach developed by the SCHN and CMRI research teams.

Lead Investigator: Prof Ian Alexander, CMRI

LA Centre for RNA Diagnostics: A pipeline of accredited RNA Diagnostics to extend diagnostic yield of rare disorders by 25 % in 5 years

This project established: the Luminesce Alliance Centre for RNA Diagnostics: Research-led RNA Diagnostics to resolve pathogenicity of splicing variant (Variants of Uncertain Significance) for 60 families with rare monogenic disorders or germline cancer; a research-pathology laboratory collaborative model to provide accredited RNA Diagnostic Service within 12 months with 95 % diagnostic return; and evaluated whether new artificial intelligence splicing prediction tools outperform historical algorithms in their ability to identify splice-altering variants. The research was identified as the most read 2022 paper in Genetics in Medicine the official journal of The American College of Medical Genetics and Genomics.

Lead Investigator: Prof Sandra Cooper, CMRI

Integrative omics: A novel approach to unravelling the complex panoramic landscape of Rett syndrome

The study explored the effectiveness of an integrative omic approach (involving metabolome, transcriptome, and proteome analysis) in identifying disease drivers, drug targets, and clinical biomarkers. These findings could subsequently serve to predict disease state, severity, and treatment effectiveness for patients with Rett syndrome. It resulted in the identification of promising clinical biomarkers, potential disease drivers, and drug targets that could potentially enhance treatment options for individuals diagnosed with Rett syndrome.

Lead Investigator: A/Prof Wendy Gold, CMRI

Accelerating and streamlining the discovery of new drugs to treat children with cancer

This project employed computational strategies to identify potential molecular drivers of childhood cancer and innovative Cas13b CRISPR technology for functional validation of these drivers in promoting cancer cell growth.

Lead Investigator: A/Prof Paul Ekert CCI

Process Development for Production of Photoreceptor Cells to Treat Blindness

The project's developed a GMP-compatible differentiation protocol for generating high-quality photoreceptor stem cells and has contributed to the long-term outcome in increasing GMP manufacturing capability in NSW. It leveraged funding of $3.3 million from the MRFF Stem Cell Mission and support from NSW Infrastructure, as well as Philanthropic donations. The research also identified the need for public and patient engagement in Inherited Retinal Diseases. To meet this need, an Inherited Retail Disease Patient Day has been scheduled for 23-24 March 2024

Lead Investigator: A/Prof Anai Gonzalez- Cordero CMRI