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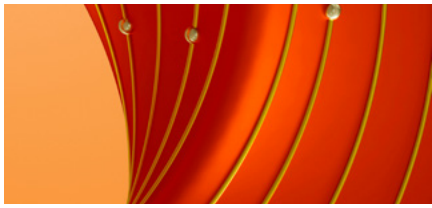
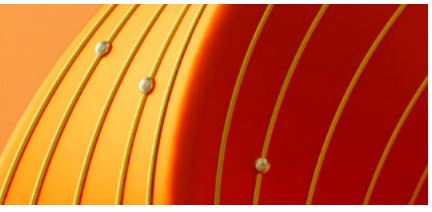
FUTURE OF THE HEALTH & MEDICAL RESEARCH WORKFORCE





RESEARCH AUSTRALIA

Championing Australian health & medical research & innovation

Strengthening Australia's paediatric precision medicine workforce

Since 2019, Luminesce Alliance has strengthened Australia's paediatric precision medicine workforce, creating STEM jobs and establishing critical training pathways for researchers and clinicians.

Dr Michelle Lorentzos, Professor Mark Cowley, Associate Professor Anai Gonzalez-Cordero, Professor Raghu Lingam and Dr Kate Hetherington | Luminesce Alliance

This includes expanding advanced therapeutics capability across Sydney Children's Hospitals Network, building Australia's largest paediatric computational biology team, and growing expertise in health economics and implementation, functional genomics and psychosocial research.

Established in 2016 with support from the NSW Government, Luminesce Alliance is a notforprofit cooperative joint venture between Sydney Children's Hospitals Network, Children's Cancer Institute, Children's Medical Research Institute, the University of Sydney and UNSW Sydney. The Alliance coordinates and integrates precision medicine research for children with cancer, rare diseases and neurodevelopmental disorders. Key workforce initiatives and impacts are outlined below - these accelerate discovery, strengthen translation into clinical care, and ensure Australia is equipped with the skilled workforce needed to deliver precision medicine at scale, now and into the future.

Increasing advanced therapeutic capability across Sydney Children's Hospitals Network

The *Kids Advanced Therapeutics (KAT) Enabling Platform* has built NSW's capability in advanced therapeutics, increasing access for children and young people. This capability strengthens advanced therapeutic clinical trial capacity and ensuring novel therapies can be safely translated from research into clinical care.

Delivering advanced therapeutics requires specialist expertise at every stage, particularly as many trials involve firstinhuman treatments with potential for adverse events. KAT focuses on developing a highly skilled, multidisciplinary workforce to manage this complexity.

"Health system readiness involves upskilling and supporting a large team—from nurses and clinical trial coordinators to allied health professionals and doctors," says Dr Michelle Lorentzos. "It's critical that the right people are in place, because it can be devastating for families and staff if a trial doesn't go to plan."

One of those 'right people' is Sarah Thompson, a Registered Nurse at Sydney Children's Hospitals Network who has received specialist training to support families participating in advanced therapeutics clinical trials.

"What I love about this work is being at the forefront of medicine," Sarah says. "You're giving brand new treatments that can change the course of a child's life, and it's very humbling to be part of that."

Sarah walks alongside families as they consider whether a trial is right for them. In some cases, a child can only ever receive one dose of a therapy. She spends many hours discussing potential benefits, risks and unknowns, particularly when a treatment has never been used in humans before.

Sarah Thompson, a Registered Nurse assisting patients during advance therapeutics trials at Sydney Children's Hospitals Network

Building Australia's largest computational biology team

Establishing Australia's largest computational biology group dedicated to paediatric cancer "has enabled us to analyse precision medicine data at a national scale for every Australian child with cancer," says Professor Mark Cowley.

The team, based at Children's Cancer Institute and *recognised at the 2025 Research Australia Health and Medical Research Awards*, has developed a precision medicine data platform integrating advanced analytical and statistical tools to guide treatment for children with highrisk cancers. By comparing a child's tumour data with a large database of similar cases, the platform identifies key genetic drivers and the treatments most likely to be effective. This capability underpins the Zero Childhood Cancer Program (ZERO), which uses molecular testing to identify precision treatment options.

Making precision medicine available for everyone

We made a targeted investment to address a critical workforce gap in health systems, implementation and economics, capabilities essential to scaling precision medicine from pilots into routine care with demonstrated value.

The *Health Systems, Implementation and Economics Enabling Platform* generates the evidence needed to inform policy, investment and service design. As Professor Raghu Lingam explains, while programs such as ZERO show what is possible, key questions remain: "What will this cost the health system, and how far should precision medicine be expanded into usual care?"

By answering these questions, the platform ensures measurable outcomes, economic value and equitable access.

NSW's Stem Cell Technology and Translation

Strategic investment through the Luminesce Alliance has enabled substantial growth in NSW's stem cell ecosystem and the *establishment of robust translational pathways* towards novel therapies. Led by A/Prof Anai GonzalezCordero at Children's Medical Research Institute, this functional genomics capability is advancing precision medicine by leveraging patientderived "miniorgansinadish," or organoids, to interrogate disease mechanisms and accelerate the development of gene and cellbased therapies.

Importantly, this capability operates as a shared research asset, with structured access provided to the broader NSW research community, amplifying impact through collaboration, skills transfer, and codevelopment of translational programs.

Supporting psychosocial wellbeing for families

One of the first studies worldwide to examine the psychosocial impacts of precision medicine explored the wellbeing, quality of life and lived experiences of children, families and health professionals involved in these programs.

Led by Dr Kate Hetherington the findings informed the development of targeted resources and workforce supports to strengthen the capability of clinicians, researchers and care teams to deliver patientcentred, holistic care in complex and rapidly evolving clinical contexts.

The study highlighted the experiences of health professionals, including the emotional and professional challenges of balancing hope with realistic expectations when discussing emerging therapies. "These conversations can place a significant burden on clinicians," Dr Hetherington notes. "Many were surprised and grateful to be asked how these developments affect them." Insights from this work are informing training, guidance and support mechanisms to better equip the workforce with the skills, confidence and psychosocial literacy required for precision medicine practice.

This research has since evolved into a *Psychosocial Enabling Platform*, supporting more than 18 research projects with specialist expertise, tools and resources.. The platform strengthens workforce capability while ensuring precision medicine is delivered with care, compassion and equity for children and families.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Authors:

1. Dr Michelle Lorentzos is the Advanced Therapeutics Medical Lead at The Sydney Children's Hospitals Network.
2. Professor Mark Cowley is Deputy Director (Enabling Platforms and Collaboration) at Children's Cancer Institute; Head of Luminesce Alliance Data Enabling Platform; co-Head of the ACRF Childhood Cancer Liquid Biopsy Program; and President of Australasian Genomic Technologies Association (AGTA).
3. Associate Professor Anai Gonzalez-Cordero is the Group Leader, Stem Cell Medicine and Head, Stem Cell & Organoid Facility at Children's Medical Research Institute and a Senior Lecturer , Faculty of Medicine and Health at The University of Sydney.
4. Professor Raghu Lingam is an academic in Paediatrics at UNSW Sydney; an Honorary Professor at the Black Dog Institute; and a Consultant Community and Neurodevelopmental Paediatrician with the Sydney Children's Hospital Network.
5. Dr Kate Hetherington is a Research Fellow and Clinical Psychologist based at the Behavioural Sciences Unit (BSU), School of Clinical Medicine, UNSW Sydney and the Sydney Children's Hospital, Randwick.