



Supporting Murdoch Children's Research Institute's drive towards Precision Child Health

Neurodevelopment

Key Facts

Neurodevelopmental disorders are lifelong conditions that begin in childhood, they are caused by disruption to early brain development

Common examples include **autism, ADHD, intellectual disability, epilepsy and cerebral palsy**. These conditions are frequently associated with cognitive, behavioural, social and academic challenges

In Australia, over **2.5 million people** have a neurodevelopmental disorder

The annual cost of autism, just one common neurodevelopmental disorder, is estimated to be **\$10 billion** in Australia

Neurodevelopmental disorders represent a major, daily challenge for these children and their families

Neurodevelopment and children

In Australia, rates of neurodevelopmental disorders such as autism are rising. Early diagnosis is difficult and tailored, reputable treatments are limited. Often, the only treatment that's available for children is symptom management.

We have limited understanding of what is actually causing these disorders or the mechanisms by which they develop. Developing this understanding will allow us to create effective and targeted treatments.

A familiar neurodevelopment disorder that is subject to these challenges is autism. Autism is characterised by difficulty relating to others, problem behaviours and a limited range of interests. It impacts children's self-esteem, quality of life, academic success and long-term mental health, leading to reduced community participation and educational and vocational opportunities. It also has major social, emotional and economic consequences for families. In most cases of autism the cause is unknown, and because of this there are no effective treatments.

MCRI's Neurodevelopment flagship is a strategic program to identify the changes that occur in neurodevelopmental disorders, which result in conditions such as autism.

Vision

Our vision is to develop personalised treatment strategies, which take into account the child's specific strengths and challenges, and their family context and resources to improve the lives of children with neurodevelopmental disorders.

Mission

To unite campus expertise in clinical care, neuroimaging and disease modelling to better understand, diagnose and treat conditions that disrupt early brain development.



MCRI's Neurodevelopment flagship

At MCRI we are taking an innovative approach to understand underlying causes of neurodevelopmental disorders, beginning with a project called "pathways to autism". The findings from this project will also provide important insights into other disorders of early brain development such as ADHD and intellectual disability.

The Neurodevelopment flagship has the resources, capacity and leadership to design and deliver a program of research that can uncover the mechanisms underpinning autism. Our novel scientific approach capitalises on unique data, platforms and resources in neuroscience, genetics, diagnostics and well-phenotyped large groups of patients. With our findings, we will develop a

template to study neurodevelopmental disorders beyond autism.

Neurodevelopmental disorders are a major focus of the Melbourne Children's Campus, and through our links with the RCH we have first-hand understanding of the challenges face by families of children with autism and other neurodevelopmental disorders.

Our team includes clinicians in neurology, developmental and behavioural paediatrics, psychology and allied health who work closely with neuroimaging, genetic and laboratory scientists.

We are supported by world-class research facilities at MCRI including the Translational Bioinformatics Lab, the Stem Cell Core, the Drug Disease

Modelling Facility, biobanking services and the Developmental Imaging Group.

United by our vision, our researchers will accelerate our understanding of the causes of neurodevelopmental disorders and develop the new interventions we need.

This will improve children's lives and provide evidence to drive policy changes, giving all Australian families access to more accurate diagnosis and effective, personalised treatment.

Leadership



Prof Rick Leventer



Prof Vicki Anderson



A/Prof Paul Lockhart



A/Prof Jonathan Payne

The Murdoch Children's Research Institute

The Murdoch Children's Research Institute (MCRI) is Australia's leading child health research organisation.

Our researchers work to translate knowledge into effective prevention, intervention and treatments for a range of disorders affecting infants, children and adolescents.

MCRI advocates for quality equitable care for all children and works closely with its partners, The Royal Children's Hospital and the University of Melbourne's Department of Paediatrics, within a single, purpose-built facility. The Campus partnership is known as Melbourne Children's, with many of the key campus research initiatives supported by The Royal Children's Hospital Foundation.

