UNIVERSITY OF NEWCASTLE

CANCER SIGNALLING RESEARCH GROUP

Innovative Therapies for Childhood Brain Cancer

The University of Newcastle's Cancer Signaling Research Group (CSRG) is at the forefront of international paediatric brain cancer research. Led by Professor Matt Dun, they are a team committed to improving survival outcomes for children diagnosed with aggressive, fatal malignancies. The research of CSRG finds or develops treatment strategies that address the underlying biological drivers of tumour growth. Their expertise in patient-derived cancer modeling, multi-omics analysis, and machine learning platforms is central to their success.

PARTNERSHIP CAPABILITIES

Multiomics Assessment and Data Analysis

- Spatial and single cell multiomics profiling: in situ specimen analysis to identify new therapeutic targets and mechanisms of treatment resistance, including spatial context (cell-cell, immune cell, normal cell interactions).
- Proteogenomic pipeline development: integration of genomics, proteomics, methylomics, and transcriptomics for in-depth, full picture tumour analysis.
- Pharmacokinetic profiling: drug characteristic assessment in blood and tumour samples

Drug Testing & Clinical Translation

- High-throughput in vitro drug screening: dose escalation, cell viability/death assessment, high-grade glioma and non-cancer models
- Specialist in vivo services: evaluation of novel and repurposed drugs using patient-derived, immune competent/compromised, xenograft mouse models, model development and characterisation.
- Rational study design: concept development, experimental design, combination targeting strategies.
- Clinical trial translation: evaluation of preclincal data package, safety/efficacy analysis, gap identification.

Research and Industry Partnership

- Preclinical/clinical drug assessment and development
- Targeted delivery of therapies with optimised brain penetration

TRANSFORMING TREATMENT FOR PEDIATRIC GLIOMA

CSRG's research is driving real change. Their preclinical analysis underpins multiple international clinical trials, across over 36 sites. These preclinical and clinical endeavours secured US Food and Drug Administration 'Rare Pediatric Disease Designation' for paxalisib and ONC201 in diffuse intrinsic pontine glioma (2020, 2024). CSRG's research is key to the US FDA confirming ONC201 as the first approved therapy for recurrent diffuse midline glioma, August 2025. DIPG and DMG patients have faced an historical survival estimate measured in months until this time, with palliative radiation therapy the only intervention offered to-date.

Josephine Laura Dun, lost to DIPG 2019, #ForeverFour

CONTACT US:

Led by Professor Matt Dun
Zac Germon
Lead Researcher
Cancer Signalling Research Group
zacary.germon@newcastle.edu.au