CoLab Forum 2026

Accelerating research, innovation and collaboration

Program & Abstracts

Children's Cancer CoLab

Children's Cancer CoLab

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About us

Children's Cancer CoLab is transforming how childhood and adolescent cancer research is funded and delivered in Australia. Through scientific rigour, cross-sector collaboration, and lived experience engagement, we're building a future where every child and adolescent with cancer can survive and thrive.

The inaugural **CoLab Forum 2026** brings our collaborative approach to life. Under the theme *Accelerating research, innovation and collaboration*, the Forum will unite the childhood cancer community for a day of connection, insight and discussion.

We unite government, philanthropy, researchers, clinicians, industry, advocates, survivors and families to accelerate discovery and improve outcomes.

CoLab Forum 2026

"The CoLab Forum will bring together the childhood and adolescent cancer community at a time when collaboration and shared knowledge are more important than ever. This event is an opportunity to showcase the collective efforts of the sector and highlight the research that is driving progress for children and families affected by cancer."

Dr Udani Reets, CEO, Children's Cancer CoLab

CoLab's Major Partners

VICTORIA State Government

CHILDREN'S CANCER FOUNDATION

Children's Cancer CoLab

Program

Time	Session
8:30 - 9:25	**Registration** *Location: Level 7 Atrium* Registration and collection of name tags with coffee and a morning snack provided.
9:25 - 9:45	**Welcome to Country** *Location: Level 7 Lecture Theatre B* Opening by **Prof Jason Payne**, Chief Executive of Peter MacCallum Cancer Centre, including the introduction of **Wurundjeri Elder, Tony Garvey** for the Welcome to Country.
9:45 - 10:05	**Opening Remarks & Funding Announcement** Presented by **Session Chair Prof Brendan Murphy AC**, Board Chair, Children's Cancer CoLab, alongside introductions and discussion with: • **Mr Nathan Lambert MP**, representing Preston and Reservoir. • **The Hon. Jaala Pulford**, Chair, Children's Cancer Foundation • **Ms Amy Coote**, Chief Executive Officer, Maddie Riewoldt's Vision
10:05 -10:50	**Keynote – Cancer Australia** **Dr Udani Reets**, CEO, Children's Cancer CoLab, will chair a discussion on lived experience and the presentation of the CAYA Roadmap, alongside: • **Dr Sheila Patel,** lived experience representative • **Ms Claire Howlett,** Deputy CEO, Cancer Australia • **Ms Margaret Fitzherbert,** CEO, Children's Cancer Foundation • **Prof David Eisenstat,** paediatric neuro-oncologist and clinician-scientist, Murdoch Children's Research Institute and The Royal Children's Hospital

Program

Time	Session
10:50 - 12:00	**Collaboration: Consortium Partners** Presentations and panel discussion by consortium partners, chaired by **Ms Bernadette McDonald**, Board Director, Children's Cancer CoLab: • **Hudson Institute of Medical Research** – A/Prof Jason Cain • **Walter and Eliza Hall Institute of Medical Research** – Dr Stacie Wang • **The University of Melbourne** – Prof David Eisenstat • **The Royal Children's Hospital** – Prof Rachel Conyers • **Murdoch Children's Research Institute** – A/Prof Maria McCarthy AM • **Olivia Newton-John Cancer Research Institute** – Prof Marco Herold • **Monash University** – Prof Lee Wong • **Monash Children's Hospital** – Dr Leanne Super • **Peter MacCallum Cancer Centre** – Prof Ricky Johnstone
12:00 - 1:00	**Lunch & Poster Session** *Location: Level 13*
1:00 - 1:45	**Discovery to Impact: Translational Advances in Paediatric Oncology** *Location: Level 7 Lecture Theatre B* Lived experience reflections and selected presentations, chaired by **A/Prof Jason Cain** and **Morgan Eisel**: • **Morgan Eisel -** Lived experience reflection • **Dr Alex Davenport (WEHI) -** *PDGFRa-CAR T cells induce sustained remission in a representative model of disseminated paediatric high-grade glioma* • **Dr Tima Shamekhi (Hudson) -** *Systematic identification of therapeutic targets in paediatric diffuse midline glioma* • **Dr Donia Moujalled (WEHI) -** *Inhibition of nicotinamide metabolism by the novel NAMPT inhibitor OT-82 potentiates venetoclax in paediatric acute myeloid leukaemia models*

Children's Cancer CoLab

Program

Time	Session
1:45 - 2:25	**The Power of Perspective: How Lived Experience Shapes Impactful Research** Panel discussion on embedding lived experience to drive impact in research, chaired by **David O'Reilly**: • **Lived experience members:** Mary Tsouvalakis, Colbey Alderson and Nader Eloshaiker • **Clinicians and researchers:** Dr Catherine Carmichael, Dr Teresa Sadras and Dr Deborah Meyran
2:25 - 3:25	**Student Spotlight: Emerging Leaders in Paediatric Oncology Research** Selected presentations featuring emerging researchers, chaired by **Dr Claire Sun** and **Dr Shane Patella**: • **Elise Young (Hudson)** - *Identifying targetable mechanisms of cisplatin resistance in osteosarcoma using CRISPR activation screening and multiomic profiling of in vitro models.* • **Shubneet Kaur (Monash)** - *High-throughput 3D modelling of medulloblastoma enables identification of a repurposed central nervous system drug for aggressive medulloblastoma suppression* • **Sophie Wang (MCRI)** - *Phenoconversion of CYP3A4, CYP2C19 and CYP2D6 in paediatrics, adolescents and young adults with lymphoma: the PEGASUS study* • **Kaitlyn Kew (ONJCRI) -** *Novel approaches to eradicate relapse-fated leukaemic clones* • **Tamia Nguyen (PMCC)**- *Next generation sequencing based UBTF tandem duplication measurable residual disease (UBTF-MRD) in patients with MDS and AML* • **Megumi Lim (QUT) -** *The financial burden of having a child with cancer – Navigating financial toxicity, support & preferences of families of children with cancer*
3:25 - 3:55	**Afternoon Tea Break** *Location: Level 13*

Program

Time	Session
3:55 - 4:55	**From Evidence to Excellence: Improving Care Through Clinical Research** *Location: Level 7 Lecture Theatre B* Lived experience reflection and selected presentations, chaired by **Dr Hannah Walker** and **Tracy Hollington**: • **Tracy Hollington** – *Lived experience reflection* • **Dr Axelle Marjolin (Redkite)** - *Understanding the economic burden of childhood cancer in Australia: Parents' experiences of cancer-related financial toxicity and opportunities for action* • **Beth Williams (MCRI)** - *Equity gaps in paediatric pharmacogenomic testing: A national analysis of ancestry representation in the MARVEL-PIC program* • **Dr Nataliya Zhukova (Hudson)** - *Building a multi-omics framework for precision risk stratification in paediatric and AYA osteosarcoma* • **Hayat Assafiri (RCH)** - *Antifungal prophylaxis patterns and invasive fungal infections outcomes in paediatric allogenic HCT: A multicentre cohort study*
4:55 - 5:00	**Awards** Presentation of awards, facilitated by: • **Scientific Program Chairs:** Dr Diane Hanna and Dr Claire Sun • **Lived Experience Chair:** David O'Reilly
5:00 - 5:05	**Closing Remarks** Closing remarks from Children's Cancer CoLab Board Members, chaired by **A/Prof Michelle Yong** and **Prof Brendan Murphy AC**
5:05 - 6:00	**Connections & Conversations** *Location: Level 13* Networking activities led by **Dr Diane Hanna** and **Trudy Marr**.

Children's Cancer CoLab

CoLab Board

Children's Cancer CoLab's governance structure is built on lived experience, scientific rigour, and clinical expertise, with childhood cancer survivors and families at the heart of every decision we make.

Led by Prof Brendan Murphy AC, our Board of Directors brings together specialised knowledge across commercialisation, healthcare, government, non-profits, and finance.

Prof Brendan Murphy AC
MBBS FRACP PhD FAHMS FAICD
Board Chair
Distinguished health executive and public servant

A/Prof Michelle Yong
MBBS FRACP MPH PhD
Board Deputy Chair
Adult infectious diseases physician and lived experience of childhood cancer

Prof Andrew Wilks
FAA FTSE FAHMS
Scientist, entrepreneur and drug discovery innovator

Prof Grant McArthur AO
MBBS FRACP PhD FAHMS
Medical oncologist and health executive

Bernadette McDonald
MHA
Children's Cancer Foundation Board member and health executive

Vivienne Petroff
BCom CA
Children's Cancer Foundation Board member and corporate finance executive

David Heath
BEc (Hons) FIAA FCPA FFin GAICD
Actuary and company director

CoLab Forum 2026 Sponsors

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Children's Cancer CoLab

CoLab Forum Program Chairs

Children's Cancer CoLab warmly acknowledges the invaluable contribution of the Co-Chairs of the Researcher and Clinician Committee and the Patient and Family Advisory Committee. Their leadership, expertise and generosity of time were central to shaping the program, curating speakers and ensuring the Forum reflects the needs and priorities of the childhood and AYA cancer community. We sincerely thank each Co-Chair for their guidance, collaboration and commitment to making the inaugural CoLab Forum a meaningful and impactful event.

Co-chairs of the Researchers and Clinician Committee

Dr Claire Sun

Hudson Institute of Medical Research

Dr Claire Xin Sun is Lead Researcher for the Advanced Informatics Program and lead bioinformatician in the Next Generation Precision Medicine program, specialising in computational biology, cancer epigenetics, and AI-driven precision medicine. She leads bioinformatics for the Childhood Cancer Model Atlas, the world's largest collection of high-risk paediatric cancer cell lines, and is recognised as an emerging leader in paediatric cancer research and immunotherapy analytics.

Dr Diane Hanna

Royal Children's Hospital

Dr Diane Hanna is a paediatric oncologist at the Royal Children's Hospital and Deputy Director of the Children's Cancer Centre Clinical Trials Unit. With more than a decade in paediatric oncology, she is Principal Investigator on multiple international trials and an emerging leader in childhood leukaemia research. She is a passionate advocate for partnering with families to drive safer, more effective therapies for children with high-risk leukaemias.

Co-Chairs of the CoLab Patient and Family Advisory Committee

David O'Reilly

Co-Chair, Patient and Family Advisory Committee, Children's Cancer CoLab

There were two pivotal moments in David O'Reilly's life: hearing that his daughter had cancer, and hearing that she was cancer-free. As unprepared as he was for cancer, he was even more unprepared for the long-term impact it had on his family – the blessings as well as the challenges. A curious, innovative solution-finder who loves to share knowledge, David brings lived experience as a cancer parent together with 16 years in academic research at Monash University and subsequent roles in marketing technology at Microsoft and martech consulting.

Lucy Francazio

Co-Chair, Patient and Family Advisory Committee, Children's Cancer CoLab

Lucy Fay Francazio was diagnosed with stage 3 Anaplastic Large Cell Lymphoma at the age of 11. She received treatment at Monash Children's Hospital and is now in remission. As the Co Chair of Colab's Patient and Family Advisory Committee, Lucy hopes to help medical professionals improve the lives of young cancer patients, and ensuring that future patients have a better experience with childhood cancer than she had.

Session details

Welcome to Country

Prof Jason Payne

Chief Executive, Peter MacCallum Cancer Centre

Professor Jason Payne is Chief Executive of the Peter MacCallum Cancer Centre and a health leader with more than 30 years' experience driving clinical excellence, research-led care and organisational performance. He leads with a strong commitment to integrating discovery, innovation and patient care to improve outcomes at scale. Known for forging high-trust partnerships and energising teams, he champions inclusive, values-led cultures that empower people to excel.

Professor Payne has spearheaded major transformation initiatives focused on workforce experience, safety and continuous improvement. Beginning his career as a Registered Nurse, he progressed through senior executive roles across major health services. He holds multiple academic appointments and contributes to several boards, helping shape the future of cancer care, research translation and health system leadership.

Tony Garvey

Wurundjeri Elder

A proud Wurundjeri man, Tony Garvey has been contributing to his community for over 30 years. He has worked for the Aboriginal co-op in Healsville as well as for Wurundjeri Council. In recent years Tony has developed his passion for Cultural Heritage Management within the council. Tony commenced delivering Welcomes six years ago when his mother, Aunty Doreen Garvey-Wandin (Senior Wurundjeri Elder), gave her blessing for Tony to take on this cultural duty. Tony has a particularly deep connection with Coranderrk – a former thriving Aboriginal Station in Healesville. Tony takes great pride in being a Wurundjeri descendant and with his strong past and contemporary connection with Coranderrk.

Opening Remarks & Funding Announcement

Prof Brendan Murphy AC (session chair)

Board Chair of Children's Cancer CoLab

Professor Brendan Murphy AC is Board Chair of Children's Cancer CoLab and a distinguished Australian public servant, health executive, nephrologist and medical researcher. He served as Australia's Chief Medical Officer from 2016 to 2020 and as Secretary of the Department of Health from 2020 to 2023, overseeing major health policy reforms. He was Australian Capital Territory Australian of the Year in 2020 and appointed a Companion of the Order of Australia (AC) in 2022.

Mr Nathan Lambert

Member of Parliment

Nathan Lambert is the Labor Member of the Victorian Legislative Assembly for Preston, representing the communities of Preston and Reservoir since his election in 2022. Before entering Parliament, he held senior roles in the Victorian public service working across forestry, resources, energy and climate change, and previously worked in leadership positions within the Australian Labor Party and as an associate at McKinsey & Company. He grew up in regional Victoria and studied computer science at the University of Melbourne before completing an MBA at the University of Oxford, and now lives in Preston with his family.

The Hon Jaala Pulford

Chair, Children's Cancer Foundation

The Hon Jaala Pulford is Chair of the Children's Cancer Foundation and a former Victorian Minister with extensive experience across industry, employment and regional portfolios. She has a long-standing commitment to improving health outcomes for children and families and brings deep expertise in public policy, governance and advocacy to her role.

Keynote address – Cancer Australia

Cancer Australia will open the session with a keynote address on its Childhood, Adolescent and Young Adult (CAYA) Roadmap. Dr Sheila Patel will share lived experience reflections, before Ms Claire Howlett, Deputy CEO of Cancer Australia, presents the Roadmap and its national priorities for improving outcomes across the CAYA cancer continuum. Dr Udani Reets, CEO of Children's Cancer CoLab, will then facilitate a closing discussion on how the Roadmap can inform research, service delivery and policy across Australia.

Dr Udani Reets (session chair)

Chief Executive Officer, Children's Cancer CoLab

Dr Udani Reets is a senior leader in Australia's health and medical sector, with extensive experience delivering innovative, large-scale initiatives and partnerships across healthcare, research and universities. As inaugural CEO of the Children's Cancer CoLab, co-founder of WILD for STEM and a non-executive Director at South Eastern Primary Health Network, she champions collaboration, connection and community as drivers of change.

Dr Sheila Patel

Patient and Family Advisory Committee, Children's Cancer CoLab

Dr Sheila Patel is a dedicated consumer advocate for childhood cancer, a role she embraced after her daughter was diagnosed with high-risk neuroblastoma at three years of age. An experienced medical scientist with training in genetics, she draws on both her personal and professional experience to champion improved care and long-term outcomes for children with cancer and survivors.

Ms Claire Howlett

Deputy Chief Executive Officer, Cancer Australia

Ms Claire Howlett is an experienced public sector leader with over 25 years' experience across national policy, program delivery, regulatory and corporate roles. She has led key areas of cancer policy for the Australian Government, including national cancer screening programs and major reforms under the Australian Cancer Plan, and is recognised for advancing evidence-informed, equitable cancer care through strong collaboration across jurisdictions and sectors.

Ms Margaret Fitzherbert

Chief Executive Officer, Children's Cancer Foundation

Ms Margaret Fitzherbert is an experienced CEO and public sector leader with a strong commitment to improving health outcomes for children and families. She brings extensive experience from senior roles across the university and health sectors, as well as not-for-profit board leadership and cancer advocacy, including as an Ambassador for Bowel Cancer Australia, and as a former chair of the Royal Women's Hospital. Margaret is also a former member of the State Parliament of Victoria.

Prof David Eisenstat

Professorial Fellow,Children's Cancer Foundation and My Room Children's Cancer Charity Chair in Childhood Cancer at the University of Melbourne

Professor David Eisenstat has held senior leadership roles in childhood and adult cancer in Canada and Australia. He was Professor and Chair of the University of Alberta's Department of Oncology (adult oncology) and Co-Director of the Cancer Research Institute of Northern Alberta (included both childhood and adult cancer research). He formerly directed the Children's Cancer Centre at the Royal Children's Hospital and established the Cancer Flagship at the Murdoch Children's Research Institute, and is now a Professorial Fellow and the inaugural Children's Cancer Foundation and My Room Children's Cancer Charity Chair in Childhood Cancer at the University of Melbourne.

Children's Cancer CoLab

Collaboration: Consortium Partners

The Collaboration Panel Session will bring leaders from each Consortium Partner together to showcase capability and catalyse collaboration across Victoria's childhood and adolescent cancer community. Through a series of concise 5-minute presentations and a facilitated panel discussion, representatives will outline their organisation's research strengths, strategic priorities and areas of alignment, before exploring how partners can work more effectively together across disciplines, institutions and settings. The session aims to build a shared understanding of complementary expertise and platforms, and to strengthen the foundations for a coordinated state-wide approach so that children and young people with cancer benefit from the full breadth of capability across the Victoria.

Ms Bernadette McDonald (session chair)

Board of Directors, Children's Cancer CoLab

Ms Bernadette McDonald is an experienced leader in the Australian health sector, known for her strategic vision, strong relationships and commitment to patient care. She brings extensive CEO and board experience, strong commercial and financial acumen, and a deep focus on governance to support better outcomes for children and young people with cancer.

A/Prof Jason Cain

Hudson Institute of Medical Research

A/Prof Jason Cain is a cancer researcher focused on understanding how childhood and adolescent tumours develop and progress, with the goal of identifying new treatments to improve patient outcomes. He leads the Developmental and Cancer Biology research group at the Hudson Institute of Medical Research and heads a major sarcoma research program. He also serves as Deputy Director of the Centre for Cancer Research and is a Director of the Australia and New Zealand Sarcoma Association.

Dr Stacie Wang

Walter and Eliza Hall Institute of Medical Research

Dr Stacie Wang is a paediatric oncologist and clinician–scientist at the Royal Children's Hospital Melbourne and WEHI, specialising in leukaemia, bone marrow transplantation, and immunotherapies. Their research focuses on developing and translating CAR T-cell therapies for high-risk paediatric cancers.

Prof David Eisenstat

University of Melbourne

Professor David Eisenstat has held senior leadership roles in childhood and adult cancer in Canada and Australia. He was Professor and Chair of the University of Alberta's Department of Oncology (adult oncology) and Co-Director of the Cancer Research Institute of Northern Alberta (included both childhood and adult cancer research). He formerly directed the Children's Cancer Centre at the Royal Children's Hospital and established the Cancer Flagship at the Murdoch Children's Research Institute, and is now a Professorial Fellow and the inaugural Children's Cancer Foundation and My Room Children's Cancer Charity Chair in Childhood Cancer at the University of Melbourne.

Collaboration: Consortium Partners

A/Prof Maria McCarthy AM

Murdoch Children's Research Institute

Associate Professor Maria McCarthy AM is a leading psycho-oncology clinician–researcher at the Murdoch Children's Research Institute and the Children's Cancer Centre, Royal Children's Hospital. She leads MCRI's Psycho-oncology Team and an internationally recognised research program focused on survivorship, quality of life and supportive care for children with cancer and their families.

Prof Rachel Conyers

The Royal Children's Hospital, Melbourne

Prof. Rachel Conyers is Director of the Children's Cancer Centre at The Royal Children's Hospital, Group Leader of Cancer Therapies at MCRI, and a Professorial Fellow at the University of Melbourne. She is an internationally recognised clinician–scientist who pioneered cardio-oncology research in Australia, established the Australian Cardio Oncology Registry, and leads major national initiatives in pharmacogenomics and precision medicine that have informed international guidelines, textbooks, and global policy.

Prof Marco Herold

Olivia Newton-John Cancer Research Institute

Prof Marco Herold is a globally recognised leader in genome engineering for cancer research and was among the first to apply CRISPR technology in Australia. Using advanced CRISPR gene editing techniques, his team specialises in targeting critical gene targets to develop next-generation cancer therapies. As CEO of ONJCRI, Prof Herold has driven the Institute's strategic growth, broadened its research programs and invested in areas such as mRNA technologies, immunogenomics, and data science, and expanded its early-phase clinical trials unit, with a focus to reach regional and rural patients.

Prof Lee Wong

Monash University

Professor Lee Wong is a cancer epigenetics researcher at Monash University and Lab Head of the Epigenetics and Chromatin Research Laboratory in the Monash Biomedicine Discovery Institute. Her research focuses on chromatin, telomeres and histone mutations driving childhood brain cancers, aiming to uncover mechanisms of genome instability and identify new targets to improve outcomes for children with brain tumours.

Dr Leanne Super

Monash Children's Hospital

Dr Leanne Super is an experienced paediatric oncologist with a special interest in adolescent and young adult cancers, sarcomas, and Hodgkin lymphoma. She trained at Monash University and works as a consultant across Royal Children's Hospital Melbourne and Monash Health, with additional training in London. She is actively involved in clinical trials and medical education, contributing to trainee supervision, university teaching, and research through the Murdoch Children's Research Institute.

Prof Ricky Johnstone

Peter MacCallum Cancer Centre

Professor Ricky Johnstone is Executive Director Cancer Research at the Peter MacCallum Cancer Centre, Head of the Gene Regulation Laboratory, and Head of The Sir Peter MacCallum Department of Oncology at the University of Melbourne. A globally recognised cancer researcher, his work focuses on how epigenetic and transcriptional changes drive cancer and how these mechanisms can be targeted to improve and prolong responses to cancer therapy.

Discovery to Impact: Translational Advances in Paediatric Oncology

This translational research session will highlight innovative approaches to developing more precise and effective treatments for children and young people with cancer. Presentations will focus on emerging strategies in brain tumours and leukaemia, showcasing how new targets and therapies are being explored in preclinical models. Collectively, the session will demonstrate how laboratory discoveries are moving closer to the clinic to improve outcomes for paediatric patients.

A/Prof Jason Cain

Hudson Institute of Medical Research

A/Prof Jason Cain is a cancer researcher focused on understanding how childhood and adolescent tumours develop and progress, with the goal of identifying new treatments to improve patient outcomes. He leads the Developmental and Cancer Biology research group at the Hudson Institute of Medical Research and heads a major sarcoma research program. He also serves as Deputy Director of the Centre for Cancer Research and is a Director of the Australia and New Zealand Sarcoma Association.

Morgan Eisel

Patient and Family Advisory Committee, Children's Cancer CoLab

Morgan is a childhood cancer advocate whose perspective is shaped by supporting her brother through cancer, giving her a strong understanding of the challenges families face. She has contributed to advocacy and fundraising initiatives, including with Ronald McDonald House Charities, and brings professional experience in event coordination and community engagement. Through her work with Children's Cancer CoLab, she aims to amplify family voices and help improve care and research for children with cancer.

PDGFRa-CAR T cells induce sustained remission in a representative model of disseminated paediatic high-grade glioma

Alexander J. Davenport[1 #], Verena C. Wimmer[1], Stacie S. Wang[1, 2, 3], Katherine S Colman[2, 3], Katherine A Watson[1], Yasmin J. Nouri[1], Ryan S Cross[1], Nathan Dalton[1], Laura Dagley[1], Vineet Vaibhav[1], Shi Eng Ng[4], Dong-Anh Khuong-Quang[2, 3], Colleen D'Arcy[5], Anna Mullins[3, 8], David D. Eisenstat[2, 3, 4], Misty R. Jenkins[1, 6, 7, *]

[1]*The Walter and Eliza Hall Institute of Medical Research, Personalised Oncology, Parkville 3052, Australia*
[2]*Murdoch Children's Research Institute, Parkville 3052, Australia*
[3]*Children's Cancer Centre, Royal Children Hospital, Melbourne*
[4]*Department of Paediatrics, The University of Melbourne, Parkville 3052, Australia*
[5]*Department of Anatomical Pathology, Royal Children Hospital, Melbourne*
[6]*Department of Medical Biology, The University of Melbourne, Parkville 3052, Australia*
[7]*La Trobe University, La Trobe Institute for Molecular Science, Bundoora 3083, Australia*
[8]*Department of Pediatric Oncology, Dana-Farber Cancer Institute/Boston Children's Hospital, Cancer and Blood Disorders Center, Boston, Massachusetts, USA*

Background: Paediatric high-grade glioma (pHGG) is a highly aggressive malignancy with limited treatment options and a dismal prognosis. Extracranial metastases are exceedingly rare and no targeted or immunotherapies are currently approved.

We report an unusual case of an 11-year-old boy with H3-wildtype, IDH-wildtype pHGG who developed widespread extracranial metastases to the scalp and lungs. Molecular profiling revealed a PDGFRA amplification with concurrent CDKN2A/B deletion, PTPN11 mutation, and TERT promoter alteration. A patient-derived orthotopic xenograft (PDX) model was established that reproduced the tumour's invasive and metastatic phenotype. Multi-omic profiling identified platelet-derived growth factor receptor alpha (PDGFRα) as a conserved therapeutic target across tumour samples, derived cell lines, and PDX tissue.

Results: PDGFRa-directed chimeric antigen receptor (CAR) T cells mediated potent cytotoxicity in vitro and achieved durable tumour remission in vivo. Treated mice showed effective CAR T cell trafficking to intracranial lesions, eradication of established disease, and long-term persistence within the choroid plexus and velum interpositum, suggesting central nervous system niches that sustain antitumour immunity. Additionally we show long term protection from tumour rechallenge up to 7 months post initital tumour clearance.

This study describes a rare clinical presentation of metastatic pHGG and demonstrates that PDGFRα CAR T cell therapy offers a rational and effective preclinical strategy. These findings support further development of PDGFRα-directed immunotherapy and highlight the potential role of CNS immune niches in enabling durable CAR T cell responses in paediatric gliomas.

Systematic Identification of Therapeutic Targets in Paediatric Diffuse Midline Glioma

Tima Shamekhi [# 1], Terry C.C Lim Kam Sian[1, 2], Gabriel Goncalves[1, 2], Joshua D Ooi[3], Bijun Zeng[4, 5], Roberta Mazzieri[4, 5], Riccardo Dolcetti[4, 5, 6], Ron Firestein[1], Pouya Faridi[* 1, 2, 7]

[1]*Centre for Cancer Research, Hudson Institute of Medical Research, Clayton, Victoria, 3168 Australia.*
[2]*Monash Proteomics and Metabolomics Platform, Biomedicine Discovery Institute, Monash University, Clayton, Australia*
[3]*Centre for Inflammatory Diseases, Monash University Department of Medicine, Monash Medical Centre, Clayton, Victoria 3168, Australia*
[4]*Peter MacCallum Cancer Centre, Melbourne, Victoria 3000, Australia*
[5]*Sir Peter MacCallum Department of Oncology, The University of Melbourne, Victoria 3010, Australia*
[6]*Department of Microbiology and Immunology, The University of Melbourne, Victoria 3010, Australia*
[7]*Department of Medicine, School of Clinical Sciences, Monash University, Clayton, Australia.*
[#] *Presenting author*
**Corresponding author*

Diffuse midline glioma (DMG) remains among the most lethal paediatric malignancies, defined by the H3K27M oncohistone mutation and profound resistance to current therapies. Despite remarkable progress in cancer immunotherapy, the antigenic determinants capable of eliciting effective T-cell responses in DMG remain undefined. Here, we delineate the first comprehensive map of H3K27M-derived and H3K27M-induced antigens and demonstrate their therapeutic tractability across multiple HLA contexts. Through an integrated multi-omics and functional pipeline combining deep immunopeptidomics, predictive modelling, and T-cell functional assays we identified and validated six naturally presented H3.3K27M neoepitopes. These neoantigens were confirmed in patient tumours by PRM-targeted mass spectrometry and elicited potent cytotoxicity when targeted by cloned H3K27M-specific TCRs in co-culture assays. To chart the broader antigenic landscape, we profiled 22 patient-derived DMG lines and 19 primary tumours, encompassing 54 distinct HLA class I allotypes and achieving 99.67% cumulative population coverage. By filtering tumour ligandomes against benign tissues' HLA datasets and using a custom proteogenomic database incorporating Riboseq-defined noncanonical ORFs, we uncovered a rich layer of antigens arising from H3K27M-driven chromatin dysregulation. Eighteen percent of tumour-exclusive ligands were recurrent across samples, identifying shared vulnerabilities amenable to off-the-shelf immunotherapeutic targeting, and selected peptides elicited robust HLA-restricted T cell activation. These findings provide a rational foundation for patient-tailored TCR-T and vaccine-based immunotherapies in a disease long considered immunologically refractory.

Abstract

Inhibition of nicotinamide metabolism by the novel NAMPT inhibitor OT-82 potentiates venetoclax in paediatric acute myeloid leukaemia models

Mawar Karsa[1, 2], Patrick Connerty[1, 2], Ayu Karsa[1], Dayna Spurling[1, 2], Giovanna Pomillio[3], Veronique Litalien[3], Laurence Cheung[4, 5, 6], Rishi Kotecha[4, 5, 7, 8], Olga Chernova[9], Andrei Gudkov[10], Richard Lock[1, 2], Murray Norris[1, 2, 11], Michelle Haber[1, 2], Andrew Wei[3, 12], Donia Moujalled[# * † 3], Klaartje Somers[† 1, 2]

[1]*Children's Cancer Institute, Lowy Cancer Research Centre, UNSW Sydney, Sydney, NSW, Australia.*
[2]*School of Clinical Medicine, UNSW Sydney, Sydney, NSW, Australia.*
[3]*Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.*
[4]*Telethon Kids Institute, Telethon Kids Cancer Centre, Perth, WA, Australia.*
[5]*Curtin University, Curtin Medical School, Perth, WA, Australia.*
[6]*Curtin Health Innovation Research Institute, Perth, Australia.*
[7]*Perth Children's Hospital, Department of Clinical Haematology, Perth, WA, Australia.*
[8]*University of Western Australia, Division of Paediatrics, School of Medicine, Perth, WA, Australia.*
[9]*Oncotartis, Inc., Buffalo, NY, USA.*
[10]*Roswell Park Cancer Institute, Buffalo, NY, USA.*
[11]*UNSW Centre for Childhood Cancer Research, UNSW Sydney, Sydney, NSW, Australia.*
[12]*Peter MacCallum Cancer Centre, Clinical Haematology, Melbourne, VIC, Australia.*
[†] *Joint senior authors*
[#] *Presenting author*
**Corresponding author*

Background: The prognosis for paediatric acute myeloid leukaemia (AML) remains poor. The BCL-2 inhibitor venetoclax has transformed adult AML therapy and is under investigation in children; however, resistance is increasingly reported. Leukaemic stem cells (LSCs) from relapsed/refractory AML exhibit increased dependence on nicotinamide phosphoribosyltransferase (NAMPT), the rate-limiting enzyme in nicotinamide adenine dinucleotide (NAD) biosynthesis, to evade venetoclax treatment. The aim of this study was to establish whether this metabolic dependency can be therapeutically exploited to potentiate venetoclax efficacy in high-risk disease.

Methods and Results: Venetoclax was combined with OT-82, a clinical-stage NAMPT inhibitor, and evaluated in AML cell lines and primary de novo and relapsed/refractory AML bone marrow samples in vitro and ex vivo using viability, live/dead, and synergy assays, as well as in paediatric AML patient-derived xenograft (PDX) models (n=9) using a Single Mouse Trial design in MISTRG mice. OT-82 demonstrated potent activity with nanomolar IC50 values while sparing healthy CD34⁺ cells from healthy donors and showed strong synergy with venetoclax in venetoclax-resistant AML models. In vivo, OT-82 potentiated venetoclax and significantly extended survival across genomically diverse PDXs, including KMT2A-rearranged and FLT3-mutant leukaemias. Integrated transcriptomic analyses indicated that therapeutic response was associated with enrichment of oxidative phosphorylation and fatty acid metabolism programs rather than specific genetic mutations.

Conclusion: This study supports advancement of OT-82 plus venetoclax as a novel combination therapy in paediatric AML, particularly those with venetoclax-resistant disease who face dismal outcomes.

Children's Cancer CoLab

The Power of Perspective: How Lived Experience Shapes Impactful Research

The Power of Perspective panel will explore how lived experience can meaningfully shape translational and clinical research in childhood and adolescent cancer. Three lived experience representatives and three clinicians/researchers will discuss how they can work together to improve outcomes for children, adolescents and young adults with cancer, guided by questions developed with the Patient and Family Advisory Committee. The session aims to provide a positive, supportive and reflective conversation that highlights practical ways to embed lived experience in research and clinical practice.

Session Chair

David O'Reilly

Co-Chair, Patient and Family Advisory Committee, Children's Cancer CoLab

There were two pivotal moments in David O'Reilly's life: hearing that his daughter had cancer, and hearing that she was cancer-free. As unprepared as he was for cancer, he was even more unprepared for the long-term impact it had on his family – the blessings as well as the challenges. A curious, innovative solution-finder who loves to share knowledge, David brings lived experience as a cancer parent together with 16 years in academic research at Monash University and subsequent roles in marketing technology at Microsoft and martech consulting.

Lived Experience Panellists

Mary Tsouvalakis

Patient and Family Advisory Committee, Children's Cancer CoLab

Mary Tsouvalakis was diagnosed with Hodgkin's disease at 16 and relapsed at 23, and has spent the more than 30 years since pursuing her passions in law, travel and the arts. She is Managing Principal Solicitor, Corporate Legal Advisory at the Victorian Department of Health, with extensive experience advising across the health and medical sectors. Mary also serves on the Board of Melanoma and Skin Cancer Trials and founded Exedra Entertainment, bringing world-class European artists to Australia.

Colbey Alderson

Patient and Family Advisory Committee, Children's Cancer CoLab

Colbey Alderson is a childhood cancer survivor who was diagnosed with Ewing Sarcoma at age 10 and has now been cancer-free for over a decade while pursuing a career as a registered nurse. He advocates for patient rights and equitable care, with a focus on gender disparities in counselling around treatment and fertility. Drawing on both lived experience and clinical training, he contributes valuable insights into survivorship and patient- and family-centred care.

Nader Eloshaiker

Patient and Family Advisory Committee, Children's Cancer CoLab

Nader Eloshaiker draws on his lived experience as the parent of a child with cancer to help shape research and innovation that truly reflects what families need. His daughter was diagnosed with B-cell acute lymphoblastic leukaemia and is now in remission, and Nader brings this journey and perspective to CoLab's work to improve outcomes for young people with cancer.

The Power of Perspective: How Lived Experience Shapes Impactful Research

Clinicians and Researchers

Dr Catherine Carmichael

Hudson Institute of Medical Research

Dr Catherine Carmichael is a molecular cancer biologist who leads the Leukaemia Modelling and Therapeutic Discovery group at the Hudson Institute of Medical Research, focusing on understanding and treating Acute Myeloid Leukaemia. Her work investigates the biological mechanisms driving leukaemia progression and identifies new therapeutic targets using advanced cellular and animal models. She also champions lived-experience involvement in research, co-founding Monash University's Consumer and Researcher Engagement (CaRE) program and contributing to national advisory committees.

Dr Teresa Sadras

Olivia Newton-John Cancer Research Institute

Dr Sadras is Head of the Leukaemia Biology and Functional Genomics Lab, advancing precision medicine through functional genomics investigating how genetic and signalling networks drive leukaemia progression and treatment response.

Dr Deborah Meyran

Murdoch Children's Research Institute, Royal Children's Hospital Melbourne, Peter MacCallum Cancer Centre

Dr. Deborah Meyran is a paediatric oncologist at the Royal Children's Hospital Melbourne and a clinician–scientist at Peter MacCallum Cancer Centre, Murdoch Children's Research Institute andthe Zero Childhood Cancer Program, leading pioneering research in paediatric cancer immunotherapy including CAR T-cell development. She established Australia's first immune profiling platform for paediatric tumours and has secured over $7 million in research funding, with publications in leading journals including Science Translational Medicine and Cancer Discovery.

Children's Cancer CoLab

Student Spotlight: Emerging Leaders in Paediatric Oncology Research

The Student Spotlight session will showcase emerging researchers driving the next wave of innovation in childhood and AYA cancer. Presentations will span laboratory, clinical and psychosocial research, including work on treatment resistance, drug repurposing, pharmacogenomics, relapse prevention, minimal residual disease and financial toxicity. Together, these talks will highlight the breadth of student-led projects contributing fresh insights and practical solutions to improve outcomes and experiences for children and young people with cancer and their families.

Session Chairs

Dr Claire Sun

Hudson Institute of Medical Research

Dr Claire Xin Sun is the Research Group Head of the Computational Therapeutic Discovery Group and Lead Bioinformatician within the Next Generation Precision Medicine Program. Her research specialises in computational biology, cancer epigenetics, and AI driven precision medicine approaches for paediatric cancer. She leads bioinformatics for the Childhood Cancer Model Atlas, the world's largest collection of high-risk paediatric cancer cell lines, and is recognised as an emerging leader in paediatric cancer research and immunotherapy analytics.

Dr Shane Patella

Patient and Family Advisory Committee, Children's Cancer CoLab

Dr Shane Patella brings his perspective as the parent of a child diagnosed with a brain tumour in childhood. Shane is passionate about innovation, equity in access to healthcare, and improving outcomes for children with cancer and their families through education and advocacy. He contributes his lived experience to help guide research and system-change priorities so they better reflect what matters most to patients and families.

Identifying targetable mechanisms of cisplatin resistance in osteosarcoma using CRISPR activation screening and multiomic profiling of in vitro models

Elise Young[1, 2, 3], Barnaby Kelly[1, 2],Jennie Do [1, 2], Nataliya Zhukova [1, 2, 3], Murray Manning[4], Dasun Fernando [4], Joseph Rosenbluh[4], Michelle Martin[3], Peter Downie[3], Leanne Sayles[5], Alejandro Sweet-Cordero[5], Vijesh Vaghjiani[1, 2], Jason Cain[1, 2]

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Background: Resistance to chemotherapy is an independent predictor of lower overall survival in osteosarcoma, however mechanisms of chemoresistance remain poorly understood. We have previously identified candidate genes that mediate response to cisplatin in osteosarcoma using a whole genome CRISPR activation (CRISPRa) screen.

Objective: To use a custom-designed CRISPRa library to screen multiple patient-derived osteosarcoma cell lines to identify mechanisms of cisplatin resistance that occur recurrently. Secondly, to model resistance to cisplatin in vitro and use multiomic profiling to define the molecular changes that occur in acquired chemoresistance.

Methods: The custom CRISPRa library consisted of 7353 sgRNAs covering 1271 genes. For the in vitro resistance models, four cell lines were treated with sub-lethal doses of cisplatin until IC50 had substantially increased and whole genome sequencing, RNA sequencing and proteomics were performed.

Results: Cisplatin-resistance models demonstrate increased mutational burden, and these mutations appear non-random. All four models demonstrated recurrent mutations in genes involved differentiation and developmental signalling including 27 genes implicated in epithelial to mesenchymal transition pathway and 18 genes involved in the WNT-Beta catenin signalling. This supports our findings from previous whole genome CRISPR activation screen.

Conclusion: By integrating functional genomic screens with in vitro modelling, we have identified the molecular pathways which mediate response to cisplatin in osteosarcoma. Future work will utilise drug screening approaches to identify molecular therapies that target these resistance mechanisms and thus could be used synergistically to enhance tumour response to chemotherapy.

High-throughput 3D modelling of medulloblastoma enables identification of a repurposed central nervous system drug for aggressive medulloblastoma suppression

Shubneet Kaur[# 1], Nathaniel Svanosio[1], Mohammed Sedeeq[2], Kaveh Baghaei[1], Iman Azimi*

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Background and Aim: Medulloblastoma is the most common malignant brain cancer in children. Current treatments result in long-term complications in survivors and poor survival rates for aggressive medulloblastoma subtypes. Current drug discovery efforts rely heavily on two-dimensional culture systems with limited tumour architecture, brain-like mechanics, and invasive behaviour recapitulation, limiting their predictive value. Therefore, this study aims to develop a physiologically relevant platform capable of identifying novel effective blood–brain barrier-permeable therapeutics with improved selectivity.

Methods and Results: A high-throughput three-dimensional soft-agar-based assay, modelling tissue stiffness and allowing quantitative assessment of medulloblastoma viability and growth, was developed in a 384-well format. Colonies of Group 3 medulloblastoma cells were grown in a 0.4% agar matrix. 320 clinically approved, brain-penetrant compounds were screened using the assay, of which several dopamine D2 receptor modulators depicted medulloblastoma suppression. Pimozide was chosen for follow-up based on its selectivity and potency. It demonstrated concentration-dependent cell viability reduction across multiple Group 3 and Group 4 medulloblastoma cell lines, with minimal toxicity to normal brain cells. Pimozide also significantly reduced c-Myc protein independently of any corresponding changes in MYC mRNA.

Conclusion: Through the development of a robust and scalable three-dimensional screening platform for medulloblastoma drug discovery, we identify pimozide as a promising therapeutic candidate for aggressive medulloblastoma treatment. Hence, warranting further preclinical evaluation for pimozide alone and in combination with existing medulloblastoma therapies.

Phenoconversion of CYP3A4, CYP2C19 and CYP2D6 in paediatrics, adolescents and young adults with lymphoma: the PEGASUS study

Sophie Wang[1, 2, 6 #], Andreas Halman[1], Tayla Stenta[1], Andrew A. Somogyi[4], Carl Kirkpatrick[5], Claire Moore[1, 2], Dhrita Khatri[1], Elizabeth Williams[1], Roxanne Dyas[1], Sarah Glewis[6, 8], May Darwish[6], Raina Naik[6], Vivian Shen[6], Tim Spelman[7, 8], David A. Elliott[1, 2, 9], Amanda Gwee[2, 10, 11], Rachel Conyers[1, 2, 3 *], Marliese Alexander[6, 8 *]

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Background and Aim: Phenoconversion is a change in drug metabolism phenotype from the gene-predicted phenotype due to non-genetic factors. Although documented, it remains underexplored in paediatric, adolescent, and young adult (AYA) oncology. The PEGASUS study aims to evaluate the feasibility and acceptability of measuring phenoconversion of three major metabolising enzymes (CYP3A4, CYP2C19, CYP2D6) in clinical care.

Methods and Results: PEGASUS is a prospective longitudinal feasibility study enrolling 20 patients aged 6-25 years with lymphoma at one paediatric and one adult quaternary referral hospital in Melbourne (NCT06383338). Participants undergo CYP3A4, CYP2C19, and CYP2D6 genotyping at enrolment. Longitudinal phenotyping is performed at up to six chemotherapy timepoints using sub-therapeutic oral omeprazole and dextromethorphan. Enzymatic activity is assessed using blood-based metabolic ratios. Acceptability is assessed via surveys informed by the Theoretical Framework of Acceptability (TFA). Of the first nine eligible patients, three AYA and two paediatric patients enrolled and have completed timepoints as scheduled. No probe drug-related adverse events were observed. Three paediatric patients declined participation. TFA-based acceptability findings indicated that non-participation was driven predominantly by feasibility constraints, such as logistical burden or competing responsibilities rather than ethical concerns.

Conclusion: Early PEGASUS findings support the safety and operational feasibility of longitudinal CYP3A4/2C19/2D6 phenoconversion assessment in AYA and paediatric oncology patients. However, paediatric recruitment remains a major barrier, underscoring the need for streamlined procedures and stronger family-centred implementation support.

Novel approaches to eradicate relapse-fated leukaemic clones

Kaitlyn Kew[1 #], Fatimah Jalud[1], Tasnia Ibnat[2], Kaylene Simpson[2], Seong Lin Khaw[3], Rasika Samarasinghe[4], Mortiz Eissmann[1], Diane Hanna[3] and Teresa Sadras[1,2*]

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Relapse of B-cell Acute Lymphoblastic Leukaemia (B-ALL) occurs in ~10% of children with <30% five-year survival, making it the second leading cause of cancer related deaths. At diagnosis, patients often harbour a small population of RAS-mutant subclones alongside dominant mutant subclones (e.g. JAK2 mutations). Despite representing a minor population, RAS-mutant subclones often drive relapse. No targeted therapies or surface biomarkers currently exist for RAS-mutant B-ALL. We hypothesize that RAS or JAK2 mutations may drive distinct signalling networks influencing drug responses and protein surface expression. To investigate this, we analysed signalling in RAS-mutant and JAK-mutant BaF3 models, and patient derived cell lines, identifying distinct transcriptional and signalling network activation, adapting to MEK inhibitors by upregulating STAT5 and AKT signalling. Phospho-proteomics revealed a distinct change in phosphorylated proteins following JAK2 inhibition in RAS vs. JAK2 clones. A high throughput drug screen of 1,960 preclinical and clinical compounds, identified pro-survival proteins as a key therapeutic vulnerability in RAS-mutant B-ALL cells. To identify biomarkers, RNA sequencing of RAS-mutant B-ALL cell lines revealed high expression of a subset of surface proteins, validated with flow cytometry. Together, these findings demonstrate that RAS- and JAK2-mutant B-ALL are driven by distinct and adaptive signalling networks, with RAS-mutant cells exhibiting a specific dependency on pro-survival pathways. These vulnerabilities highlight potential therapeutic targets. The identification of RAS-associated surface proteins provides candidate biomarkers for improved disease stratification and may enable targeted immunotherapy development for this high-risk subgroup.

Next generation sequencing based UBTF tandem duplication measurable residual disease (UBTF-MRD) in patients with MDS and AML

Tamia Nguyen[# 1, 2, 3], William Nicol[4], Noel Djitro[1, 2, 3], Lachlin Vaughan[5, 6, 7], Seong L. Khaw[8], Courtney Tate[9], Jad Othman[10], Sushmitha Kannan[1, 3], Yan Zhuang Yap[1, 3], Sally Hunter[1, 3], Andrew H. Wei[4, 11, 12], Piers Blombery[1, 2, 3], Ing Soo Tiong[* 1, 2, 3]

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Background: UBTF tandem duplications (UBTF-TD) define an adverse-risk subtype of MDS/AML that occurs predominantly in children and young adults. The role of molecular measurable residual disease (MRD) assessment in this group is currently unknown.
Aims: To evaluate analytical performance and clinical utility of a molecular UBTF-TD MRD assay.

Methods: A DNA-based amplicon NGS assay targeting UBTF exon 13 (NM_014233.3) was developed with 10-6 sensitivity. UBTF-MRD was compared with paired flow cytometry MRD (MFC-MRD) and FLT3-ITD MRD where available. Molecular lead time was defined from first UBTF-MRD rise to morphologic relapse.

Results: Eleven patients were identified (9 AML, 2 MDS-EB2), including 9 aged 6-25 years. Across 54 marrow samples in morphologic remission, UBTF-MRD was detected in 40 (74%) at 0.0003-45% VAF, including 4 samples (3 patients) with >30% VAF, consistent with persistence of a dominant pre-leukaemic clone. 13/38 paired samples were MFC-negative/UBTF-positive, and 4/5 paired samples were FLT3-negative/UBTF-positive.
Among patients underwent allogeneic stem cell transplant (allo-SCT), rising UBTF-MRD consistently preceded relapse. In three morphologic relapses with serial sampling, UBTF-MRD increased 3-7 months prior to relapse at 0.51-0.94 log10 rise/month. Two additional patients showed rising UBTF-MRD with MFC progression, whereas patients with durable remission showed molecular clearance or sustained negativity.

Conclusion: We developed a highly sensitive NGS MRD assay for UBTF-TD. While UBTF-TD clonal haematopoiesis may confound some remission assessments, serial UBTF-MRD assessment post-alloSCT detected relapse earlier than flow cytometry in children and young adults with UBTF-TD MDS/AML, warranting validation in larger cohorts.

Abstract

The Financial Burden of having a Child with Cancer – Navigating Financial Toxicity, Support & Preferences of Families of Children with Cancer

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Background: Families of children with cancer experience substantial financial hardship arising from out-of-pocket expenses, productivity losses, repeated hospital visits, and disrupted employment. Despite Australia's universal healthcare system, little is known about the magnitude of these costs, the effectiveness of existing financial aid, or how support can be improved.

Methods: A mixed-methods program of four studies was employed. A prospective costing study of families of children with brain tumours quantified out-of-pocket costs, productivity losses, and reimbursements, analysed using a generalised linear mixed model. A scoping review and qualitative interviews (with parents, oncology social workers, and charity representatives) explored barriers and enablers in financial aid access and identified recommendations for improvement. Finally, a discrete choice experiment (DCE) quantified parental preferences and heterogeneity for key financial aid attributes.

Results: Families incurred substantial and persistent costs, with reimbursements uncommon and typically covering less than 25% of expenses. Financial burden was inequitably distributed, with higher costs among regional/rural families and those undergoing intensive treatment. Systemic barriers to aid included complex application processes, inconsistent eligibility criteria, and fragmented information. The DCE demonstrated that families prioritise simplicity, fairness, and timely payment structures.

Conclusions: This research informs the design of more equitable financial aid programs, with findings currently guiding development of a digital navigation app. The cost estimates also provide parameters for societal-perspective economic evaluations in paediatric oncology.

From Evidence to Excellence: Improving Care Through Clinical Research

This clinical research session will explore how real-world evidence can inform better, safer and more equitable care for children and young people with cancer. Presentations will examine the economic burden and financial toxicity experienced by families, equity gaps in access to paediatric pharmacogenomic testing, new multi-omics approaches to risk stratification in osteosarcoma, and patterns of antifungal prophylaxis and infection outcomes following allogeneic transplant. Collectively, the session will highlight how clinical data, patient experience and advanced analytics can guide improvements in treatment, supportive care and system-level practice.

Session Chairs

Dr Hannah Walker

Murdoch Children's Research Institute, Royal Children's Hospital Melbourne

Dr Walker is a paediatric oncologist and Bone Marrow Transplant Consultant at the Royal Children's Hospital Melbourne and post doctoral researcher in the Cancer Therapies group at the Murdoch Children's Research Institute. She is pursuing a career as a clinician scientist with a vision to improve the survivorship of patients undergoing treatment for cancer and advanced cellular therapies, with a special interest in infectious and inflammatory complications.

Tracy Hollington

Patient and Family Advisory Committee, Children's Cancer CoLab

Tracy Hollington is a Western Australian solicitor and longstanding advocate for children and adolescents affected by cancer, drawing on her family's lived experience after her son was diagnosed with Ewing Sarcoma and later treatment-related Acute Myeloid Leukemia. She currently serves as Chairperson of the Child Cancer Research Foundation and is passionate about survivorship care, psychosocial support, and equitable access to clinical trials and services for young people with cancer.

Understanding the economic burden of childhood cancer in Australia: Parents' experiences of cancer-related financial toxicity and opportunities for action

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Background and Aim: Parents play a pivotal role in supporting their child through a cancer diagnosis, providing emotional reassurance alongside intensive practical caregiving. They also absorb much of the economic burden, as caregiving-related disruptions to employment can reduce household income while cancer-related costs accumulate. Without adequate support, this financial strain exposes families to lasting negative psychosocial outcomes. This study aimed to examine parents' experiences of cancer-related financial toxicity and identify opportunities to strengthen the supports available to them.

Methods and Results: Using a mixed-methods design, data was collected via an online survey of 520 parents and semi-structured interviews with nine survey participants. Many parents reported substantial out-of-pocket costs, employment disruption, and income loss. The intense and unpredictable caregiving demands were a key driver of employment changes at diagnosis and often persisted into survivorship or bereavement. While unmet financial needs appear to be increasing, with 69% reporting an unmet financial need during treatment compared to 45% in 2020, existing formal supports, including from government, were often perceived as inadequate. In contrast, respondents found financial support from charities, family and friends, and crowdfunding more helpful to their situation.

Conclusion: Parents affected by childhood cancer report substantial out-of-pocket costs, disrupted employment, and gaps in existing support systems. Strengthening workplace flexibility, improving the adequacy and accessibility of government assistance, and sustaining community-based financial supports are critical to reducing the financial burden on families.

Equity gaps in paediatric pharmacogenomic testing: A national analysis of ancestry representation in the MARVEL-PIC program

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Background and Aim: Pharmacogenomic (PGx) testing is increasingly implemented in paediatric oncology to reduce adverse drug reactions and improve treatment tolerability. However, most PGx evidence underpinning clinical guidance derives from adult populations of European ancestry, raising concerns about equity, generalisability and access for culturally and linguistically diverse children. This study aimed to evaluate ancestry representation and equity of access within a national paediatric PGx implementation program.

Methods and Results: This retrospective, multi-site study included over 600 paediatric oncology patients considered for PGx testing through the MARVEL-PIC program across four Australian children's hospitals (January 2023–January 2026). Patients were classified as enrolled (complete or incomplete), declined or ineligible. Self-reported and medical record ancestry, including language indicators, were analysed descriptively and compared across participation categories and population benchmarks.

Among patients deemed ineligible due to language barriers, 27% were Arabic speakers and 19% spoke languages native to Afghanistan. Under-representation of some ancestry groups among enrolled patients, alongside higher decline proportions, indicates implementation inequities related to access, consent, and communication.

Conclusion: Inequities in access to paediatric PGx testing are already measurable in real-world implementation. Without culturally responsive strategies, precision medicine risks widening existing disparities. These findings will directly inform co-designed, equity-focused consent and engagement approaches to support inclusive national PGx delivery.

Building a Multi-Omics Framework for Precision Risk Stratification in Paediatric and AYA Osteosarcoma

Nataliya Zhukova[# * 1, 2, 3, 4], Lakshmi P Sundaravel[1], Vincent Xue[1], Rheannon Blucher[1, 2], Elise Young[1, 2, 3], Claire Sun[1], Bronwyn Christiansen[5], Pranav Dorwal[6, 7], Christine White[8], Elizabeth Connolly[9], Leanne Super[3, 4], Charlotte Chen[10], Paul Neesen[10], Claudia Di Bella[11], Roger R Reddel[8], Paul Wood[3, 4], Peter A Downie[3, 4], Michelle Martin[3, 4], Jason E Cain[1, 2, 4]

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Despite multi-modal therapy, 42% of paediatric and adolescent and young adult (AYA) osteosarcoma patients relapse, with limited survival improvement over three decades. Current risk stratification inadequately captures the biological heterogeneity driving therapeutic resistance and tumour evolution, highlighting the need for clinically annotated, outcome-linked multi-omics datasets to inform precision strategies.

We established a comprehensive paediatric/AYA osteosarcoma cohort of 132 patients across two Victorian tertiary centres (1996-2022), median follow-up 83 months. This resource integrates detailed clinical annotation with 246 multi-omics datasets: whole-exome sequencing (n=96), RNA sequencing (n=96), and DNA methylation profiling (n=54). Thirty-six tumours have complete tri-platform profiling including paired primary–relapse samples, enabling longitudinal interrogation of tumour evolution.

Five-year OS and PFS were 61% and 49%, respectively. Multivariable modelling confirmed relapse and poor histologic response as independent predictors of inferior OS; poor histologic response and metastatic disease independently predicted inferior PFS. Multi-omics analysis identified transcriptional programs associated with relapse, tumour microenvironment remodelling, epithelial-mesenchymal transition, and treatment resistance, detectable at diagnosis in patients who later recurred.

This dataset establishes a scalable precision oncology framework for osteosarcoma, translating integrative multi-omics modelling into a biology-informed risk stratification tool that sets a new standard for paediatric and AYA osteosarcoma management.

Antifungal Prophylaxis Patterns and Invasive Fungal Infections Outcomes in Paediatric Allogenic HCT: A Multicentre Cohort Study

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Background: Invasive fungal infections (IFIs) remain major complications following pediatric hematopoietic stem cell transplant (HCT). Evidence guiding antifungal prophylaxis in children is limited, particularly regarding mold-active strategies. We examined prophylaxis patterns and associated IFI incidence in a multicenter pediatric HCT cohort.

Methods: We retrospectively reviewed children undergoing first allogeneic HCT (between 2016–2022) at two Australian centers (RCH and PCH). Second HCTs were excluded. Prophylaxis was analyzed during pre-engraftment (conditioning–Day 30) and post-engraftment (Day 31–100). Agents were classified as non-mold-active (fluconazole), mold-active (micafungin, liposomal amphotericin B, voriconazole, posaconazole), or mixed regimens. IFIs were defined as proven, probable, or possible.

Results: We analyzed 239 HCT episodes. Median age was 6.9 years; 59% were male. Twenty-five patients (10.5%) had prior-IFI pre-HCT and were older with more malignant disease. Among those without prior-IFI pre-HCT (n=214), pre-engraftment prophylaxis was mainly fluconazole (72%), followed by mold-active (22%) and mixed regimens (6%). Prior-IFI patients predominantly received mold-active prophylaxis (60%), with fluconazole rarely used (8%). Overall IFI incidence was low (10.5%). In the prior-IFI group, all IFIs occurred pre-engraftment. In patients without prior-IFI, most IFIs occurred post-engraftment (61%). All proven IFIs occurred during fluconazole monotherapy.

Conclusion: Prophylaxis was risk-adapted. IFIs occurred across strategies, with proven IFIs observed only with fluconazole. The predominance of post-engraftment IFIs, alongside early events in prior-IFI patients, supports consideration of risk-based mold-active escalation in high-risk children.

Posters

POS 1	Generating renewable preclinical models of childhood cancer: The Hudson Institute Living Biobank	Max Moraleda
POS 2	Developing an iPSC-Based Cerebellar Organoid Platform with Inducible Oncogenes to Model Medulloblastoma for Therapeutic Screening	Kaveh Baghaei
POS 3	Designing a Translational Precision Oncology Ecosystem: Integrating Biobanking, Molecular Eligibility, and Targeted Therapy Data in Paediatric Cancer	Nataliya Zhukova
POS 4	Kids Oncology And Leukaemia or Allograft – PharmacoKinetics (KOALA-PK): A Study Protocol	Claire Moore
POS 5	Decoding the Epigenome to Drive Biomarker Discovery in Paediatric Brain Tumours	Claire Sun
POS 6	The Influence of Glioma on interneurons in Glioma-Infiltrated Human Brain	Hefei Guan
POS 7	The Neuroscience of Glioma and Memory	Samuel Combes
POS 8	Defining the extracellular matrix for targeted immunotherapy in adult and paediatric brain cancer	Zoe Day
POS 9	Radiation-Induced Remodeling of the HLA-I Immunopeptidome in Paediatric H3K27M Diffuse Midline Glioma	Nurfarhanah Syed Sulaiman
POS 10	Exploring and targeting therapy-induced cellular senescence in medulloblastoma	Charmaine Chng
POS 11	Exploring the Antigenic Landscape of Ewing Sarcoma for HLA-Dependent T-Cell Therapy	Grace Huang
POS 12	Cancer Testis Antigens are Potential Immunotherapy Targets for Prevention and Treatment of Metastatic Osteosarcoma	Mersedeh Shayan

POS 13	Exploring CAR T cell therapy and immunomodulatory agents in immunocompetent paediatric brain cancer models	Milie Desai
POS 14	Identification of mechanisms underlying poor response to standard of care therapy in childhood and adolescent osteosarcoma using a novel model of in vivo acquired cisplatin resistance	Barnaby Kelly
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POS 1

Generating renewable preclinical models of childhood cancer: The Hudson Institute Living Biobank

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Preclinical models which accurately represent the diversity of childhood cancers are currently limited. Although preclinical childhood cancer models have been established over the past few decades, these do not properly represent the original tumour due to an accumulation of genetic and molecular drift and genomic mutations. Clinically relevant, representative and renewable preclinical models of childhood cancer are therefore essential for research and the development of new treatment. The Hudson Living Biobank aims to develop widely accessible and diverse models of rare childhood cancers, using state of the art techniques and improved in vivo and in vitro validation pipelines.

Excess surgical tissue from various Victorian paediatric medical institutions is used to establish patient derived xenograft (PDX) models. Fragments of tumour are engrafted surgically into immunodeficient NSG mice via subrenal implantation. Established tumours are excised for validation, via molecular pathology, or repassaged. During tumour processing, a single cell suspension is prepared to develop in vitro cell models. These cells are cultured in optimal growth media, with successful cell lines sorted for human cells by anti-human HLA antibody via FACS. Cell line models are validated through genomics, immunohistochemistry and RNAseq. We have since processed 10 unique childhood cancer types, performed tumour engraftment on 52 mice and have successfully generated 6 PDX models. We have generated and catalogued 54 vials of cryopreserved cells, 45 vials of cryopreserved tumour and 13 vials of snap frozen tumour.

We have developed an efficient pipeline for generating, validating, and storing representative preclinical models of childhood cancer to support future research and treatment development.

POS 2

Developing an iPSC-Based Cerebellar Organoid Platform with Inducible Oncogenes to Model Medulloblastoma for Therapeutic Screening

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Medulloblastoma is the most common malignant brain tumour in children, arising from abnormal cerebellar development and dysregulated oncogenic signalling. Current drug discovery mainly relies on 2D cell cultures, which do not capture the three-dimensional structure, cellular diversity, or tumour–brain interactions seen in vivo, limiting accurate assessment of therapeutic response and toxicity.

Human iPSC-derived cerebellar organoids offer a more physiologically relevant platform to model tumorigenesis and improve drug screening. Here, we developed a robust method to generate cerebellar organoids from human iPSCs and induced transformation using clinically relevant oncogenic pairs: MYC with OTX2 (Group 3/4–like) and MYC with GFI1 (Group 3). Cerebellar differentiation was validated via time-course analysis of ventricular zone and rhombic lip markers. Oncogenes were delivered by electroporation of fluorescent PiggyBac plasmids, with stable expression, though timing, plasmid distribution, and transfection variability remain key considerations.

To enhance integration efficiency and gene control, we are implementing a doxycycline-inducible PiggyBac transposase system, enabling stable, regulatable expression with fluorescent tracking and puromycin selection, providing greater consistency and temporal control.

Overall, this platform supports physiologically relevant drug screening and therapeutic assessment in medulloblastoma. The inclusion of cerebellar cells allows simultaneous evaluation of tumour response and potential toxicity to normal brain tissue, while expandable mini-tumour organoids enable scalable testing and facilitate therapeutic strategies beyond traditional 2D culture models.

POS 3

Designing a Translational Precision Oncology Ecosystem: Integrating Biobanking, Molecular Eligibility, and Targeted Therapy Data in Paediatric Cancer

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Despite advances in selected childhood malignancies, outcomes for high-risk solid and CNS tumours remain poor. Molecular diagnostics have accelerated targeted therapy use, yet real-world administration remains heterogeneous, with fragmented capture of response, toxicity, and resistance data. We aimed to build an integrated translational ecosystem moving systematically from tissue acquisition to molecular eligibility, targeted therapy delivery, and longitudinal outcome capture. Since 2011, the Monash Children's Cancer Biobank has embedded tissue acquisition into routine multidisciplinary care. Coordinated integration of surgical, pathology, oncology, and biobank teams transformed collection from opportunistic to near-universal for solid and CNS tumours, improving identification of actionable alterations and eligibility for molecularly enabled trials. A two-stage targeted therapy infrastructure initiative was launched. Stage 1 retrospectively mapped institutional targeted therapy use (2018-2021), revealing significant gaps in documentation of toxicity, response durability, and resistance. Stage 2 will establish a dedicated database for prospective longitudinal capture of molecular profiles, treatment exposure, response trajectories, adverse events, and outcomes.
This framework closes the precision oncology loop: biobanked tissue enables molecular eligibility; profiling guides therapy; longitudinal data generate real-world evidence; and biospecimens support translational research. Coordinated tissue and data infrastructure is essential for equitable trial access, safer targeted therapy implementation, and scalable evidence generation in paediatric oncology.

POS 4

Kids Oncology And Leukaemia or Allograft – PharmacoKinetics (KOALA-PK): A Study Protocol

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Background and Aim: Chemotherapy is a cornerstone of cancer treatment, yet chemotherapy toxicity itself is a common cause of morbidity and mortality in children with a cancer diagnosis. Historically most chemotherapy doses in children have been derived from adult doses and scaled accordingly.1 There are limited pharmacokinetic data for some of the most toxic chemotherapeutics in children, including cyclophosphamide, melphalan and fludarabine2. Although it is known that children experience age-related differences in drug metabolism, these differences are poorly characterised. Developing population pharmacokinetic models for high-toxicity chemotherapy would allow for more precise prescribing, driving better patient outcomes.

Methods and Results: KOALA-PK is a single-site prospective observational study that aims to characterise the pharmacokinetic/pharmacodynamic behaviour of high-toxicity chemotherapy in children across different ages. The study will combine pharmacokinetic samples, pharmacogenomic analysis, adverse drug reaction and inefficacy data of high toxicity drugs to develop population pharmacokinetic models and ultimately inform optimised dosing strategies. The first stage of KOALA-PK will investigate cyclophosphamide, busulfan, fludarabine and melphalan. All patients aged 1month –18 years with a cancer diagnosis or receiving a haematopoietic stem cell transplant and prescription of one of the study drugs are eligible. Conclusion: The KOALA-PK study is the first of its kind and will lead to greater understanding of how high-toxicity chemotherapy affects children of different ages, ultimately informing dosing strategies. More precise dosing of high-toxicity chemotherapy is necessary to reduce adverse drug reactions and improve efficacy.

POS 5

Decoding the Epigenome to Drive Biomarker Discovery in Paediatric Brain Tumours

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Paediatric central nervous system (CNS) cancers are a leading cause of cancer related mortality in children and are driven by distinct developmental and epigenetic mechanisms. Systematic epigenetic characterisation across paediatric CNS models, however, remains limited. The Childhood Cancer Model Atlas (CCMA) was established as a globally accessible resource with a strategic focus on CNS tumours, integrating molecular profiling, functional genomics, and drug response data across a diverse collection of paediatric CNS cell line models.

To deepen biological insight, we developed CCMA EPIC, an epigenetic framework to characterise chromatin landscapes across CCMA models. CCMA EPIC defines chromatin states using six key histone modifications capturing active promoters, enhancers, transcriptionally active regions, and repressive chromatin. This enables systematic annotation of model specific chromatin states and reveals substantial epigenetic heterogeneity and lineage specific regulatory programs not evident from genomic data alone.

We further evaluated the functional relevance of CCMA EPIC by integrating chromatin state features into machine learning models predicting CRISPR gene dependency and drug response. Inclusion of epigenetic features significantly improved prediction accuracy compared to genomic and transcriptomic models alone, highlighting selective dependencies and therapeutic vulnerabilities linked to transcriptional regulators and chromatin modifying pathways. Together, these findings demonstrate that integrating epigenetic context enhances biomarker discovery and advances precision therapeutic strategies for paediatric CNS tumours.

POS 6

The Influence of Glioma on interneurons in Glioma-Infiltrated Human Brain

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Gliomas are highly invasive primary brain tumours which have been shown to integrate into the neural networks of the brain. Glioma cells are known to form functional synapses with excitatory neurons, yet their impact on other cell types in the adult cortex remains poorly understood. Inhibitory interneurons play an important role in modulating the excitability of neural networks. Here, the influence of glioma on inhibitory interneurons was probed using in vitro patch-clamp electrophysiology from parvalbumin (PV) interneurons, excitatory neurons and glioma cells in brain slices obtained from consenting brain tumour patients. Our results demonstrate that inhibition is altered in glioma-infiltrated neural networks, with a change in the balance of inhibitory input to pyramidal neurons. Although glioma minimally influences the biophysical properties of PV interneurons, there was an impact on the density of interneurons within all layers of the cortex. Together, these results highlight the profound impact of glioma infiltration on inhibitory circuits and provides critical insights into glioma-induced neural dysfunction, which may inform future therapeutic strategies for glioma-associated neurological deficits.

POS 7

The Neuroscience of Glioma and Memory

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Background: Gliomas are aggressive primary brain tumours arising from glial cells, with ~95% five-year mortality. In addition to poor survival, patients exhibit profound cognitive decline, particularly in memory, often exceeding deficits in attention or language. However, the mechanisms by which gliomas disrupt memory encoding remain poorly understood, largely due to challenges in studying invasive tumours in vivo.

Aims: This project examines (1) how glioma infiltration alters excitatory and inhibitory encoding of working memory, and (2) how neural activity influences glioma growth.

Methods: Human infiltrating glioma was modelled in immunocompromised NSG mice via injection of GFP-tagged MU035 cells into prefrontal cortex (M2). jRGECO1a virus was co-injected to label neurons, and a cranial window with headbar enabled chronic imaging. Two-photon calcium imaging was performed in awake, head-fixed mice trained on a working memory task requiring a lick response to a 200 Hz, 200 ms contralateral forepaw stimulus after a ~1 s delay. Neural activity was tracked longitudinally over ~16 weeks of tumour infiltration.

Results: Glioma expansion occurred at ~35–40 nm/day across M2, with progression visible up to ~120 days post-injection. Expert task performance (>60% hit rate) was associated with increased action potential amplitudes during the delay epoch. Across 16 weeks—until tumour coverage of the imaging window—neural activity initially increased, followed by a decline. Conclusions: These findings suggest experience-dependent plasticity in excitatory memory circuits that becomes progressively dampened during glioma infiltration, highlighting circuit-level mechanisms that may inform novel therapeutic strategies.

POS 8

Defining the extracellular matrix for targeted immunotherapy in adult and paediatric brain cancer

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Background and Aim: Adult and paediatric high-grade gliomas (HGGs) are aggressive brain cancers with dismal outcomes; adult 5-year survival is ~5% and paediatric HGGs (pHGG) are almost universally fatal. Chimeric antigen receptor (CAR) T cell therapy has transformed outcomes for some blood cancers and is well tolerated in early pHGG trials, but efficacy in solid tumours is limited, in part by poor T-cell infiltration. We hypothesise that the dense extracellular matrix (ECM) in the HGG tumour microenvironment forms a physical and biochemical barrier to T-cell entry and function. We therefore characterised ECM composition in primary adult and paediatric HGG using immunohistochemistry and cell-surface proteomics, revealing a heterogeneous ECM enriched for heparan- and chondroitin-sulfate proteoglycans and multiple collagen isoforms.

Methods and Results: Cell-surface proteomics of primary paediatric DIPG identified abundant ECM and ECM-associated receptors including CSPG4, CSPG5, PTPRZ1, BCAN and NCAN. We applied ImmunoTar, a machine-learning target-ranking framework integrating surface proteomics with public datasets, to prioritise tumour-selective, surface-accessible immunotherapy targets. ImmunoTar highlighted a paediatric ECM target set (CSPG4/5, TGFBR3, SDC1-3, PTPRZ1, PLG and GPC2), nominating GPC2 as a high-ranking oncofetal candidate. Low-affinity GPC2 CAR T cells mediated antigen-specific killing of patient-derived SU-DIPG36 cells over 72 h versus donor-matched controls.

Conclusion: Multi-omic, surfaceome-guided mapping of the paediatric glioma ECM identifies tractable tumour-associated ECM antigens and supports ECM-targeted CAR T strategies, including GPC2, as a route to innovative therapies for paediatric HGG.

POS 9

Radiation-Induced Remodeling of the HLA-I Immunopeptidome in Paediatric H3K27M Diffuse Midline Glioma

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H3K27M diffuse midline gliomas (DMGs) are devastating paediatric brain tumours for which radiotherapy (RT) remains the primary treatment modality. Although responses are transient, re irradiation can provide modest benefit, underscoring the continued clinical reliance on RT. Beyond cytotoxicity, RT can induce immunostimulatory effects, including upregulation of HLA class I (HLA-I) expression and antigen presentation. However, how radiation reshapes the HLA I immunopeptidome in H3K27M DMGs remains largely unexplored.

This study aims to comprehensively profile radiation-induced alterations of the HLA-I immunopeptidome and proteome in H3K27M DMG cell lines.

In vitro RT responses were assessed in three paediatric H3.3K27M DMG cell lines (SF7761, SU DIPG19, SU DIPG27), comprising one radiation naïve line and two autopsy derived, previously irradiated. Cells were irradiated at 5 Gy or 10 Gy and harvested 72 hours post treatment. HLA-I surface expression was measured by flow cytometry. Triplicate pellets were processed for HLA I immunopeptidomics and global proteomics. IFN γ–treated cells served as an internal control.

Radiation induced a 1.5–1.8-fold increase in HLA-I cell surface expression across all lines. Shared peptides within the core immunopeptidome displayed increased presentation of peptides post radiation. These were enriched for source proteins involved in DNA repair, cell cycle regulation, and oxidative stress responses, demonstrating that the immunopeptidome of irradiated cells reflects key features of the radiation induced stress state. Collectively, these findings indicate that radiation alters the antigenic landscape of DMG cells, warranting further investigation of radiation-induced peptides in the context of developing next generation immunotherapies.

POS 10

Exploring and targeting therapy-induced cellular senescence in medulloblastoma

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Medulloblastoma is the most common malignant paediatric brain tumour, accounting for ~20% of childhood brain cancers. Although chemotherapy is essential for treatment, its toxicity contributes to long-term morbidity and aggressive relapse. Cellular senescence, a growth-arrest state triggered by DNA damage, has been linked to therapy resistance and tumour recurrence in multiple cancers; however, its role in medulloblastoma remains poorly defined. If present, targeting senescent tumour cells may represent a strategy to enhance treatment outcomes. This study investigated whether standard-of-care medulloblastoma therapies induce cellular senescence in preclinical medulloblastoma models. Group 3 (D341, MED-411) and Group 4 (CHLA-01, CHLA-01R) cell lines were treated with vincristine or cisplatin for 24 h, followed by assessment of cell viability and senescence-associated biomarkers, including nuclear and cell area, SA-β-galactosidase activity, p21, p16, and EdU incorporation at 7 or 14 days post-treatment using single-cell high-content fluorescence imaging. The senolytic agent ABT-263 was then evaluated for its ability to enhance tumour cell elimination following vincristine exposure. Both agents induced a senescence-like phenotype with temporal heterogeneity, increased p16 and/or p21 expression, and concentration-dependent reduction in EdU incorporation across all lines. Morphological markers were variable, with increased nuclear and cell area observed only in D341. Notably, combined vincristine and ABT-263 synergistically reduced D341 viability. These findings suggest that vincristine and cisplatin can induce a senescence-like state in medulloblastoma cells and provide preliminary support for exploring senolytic–chemotherapy combinations to enhance therapeutic responses.

POS 11

Exploring the Antigenic Landscape of Ewing Sarcoma for HLA-Dependent T-Cell Therapy

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Background and Aim: Ewing Sarcoma (ES) is the second most common primary bone tumour children and adolescents and is driven by the aggressive nature of the EWS-FLI1 fusion. Outcomes for patients with metastatic or relapsed disease remain poor, with five-year survival <30%, and current treatments often cause long-term toxicities, highlighting the need for targeted, less harmful therapies. In this study, we aim to define the antigenic landscape of Ewing sarcoma to uncover targets for Human Leucocyte Antigen (HLA)-dependent T-cell therapy.

Methods and Results: HLA class I peptides from seven ES cell lines (covering ~96% of the global population by HLA type; +/- IFNγ) and 19 patient-tumour tissues were profiled using SAPrIm workflow and mass spectrometry. Downstream analysis included reference to TANTIGEN and HLA Ligand Atlas to identify potential tumour targets. 58,261 HLA class-I peptides from 10,321 source proteins were identified in cell lines. Of these, we focused on 29 target antigens that are largely absent from benign tissues. 21 of these antigens and their peptides were also detected in patient-tissues, highlighting their therapeutic relevance. A key finding was the discovery of a peptide derived from the EWS-FLI1 fusion, spanning the junction. Spectral validation and identification of four highly fusion-reactive T cells confirm natural HLA presentation of the fusion peptide and shows potential as a highly specific target for TCR-T therapy for ES patients.

Conclusion: Our findings establish a rich repertoire of HLA class-I antigens in Ewing sarcoma and provide a strong foundation for the development of HLA-dependent therapies such as T cell therapies, advancing precision immunotherapy approach for Ewing sarcoma.

POS 12

Cancer Testis Antigens are Potential Immunotherapy Targets for Prevention and Treatment of Metastatic Osteosarcoma

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Background: Osteosarcoma (OS) is a bone cancer with limited treatments and poor survival rates for metastatic cases. At least 1 in 5 patients has metastasis, typically in the lungs, at the time of diagnosis. Detecting mutual tumour-associated antigens, like cancer-testis antigens, on the primary and metastatic sites offers alternatives for treatment and prevention of OS. Human leukocyte antigen (HLA)-based immunotherapy trains the immune system to target these antigens and remove the tumour.

Methods: Peptide-HLA complexes from patient-derived cells (U2OS, B143, SJSA) and tissue specimens (lung metastasis biopsy, paired primary–metastatic tumours from a CDX mouse model) were extracted. The peptides were analysed by LC-MS/MS on the Astral mass spectrometers, then matched against the reviewed human proteome database (Uniprot), the CTdatabase, and the HLA Ligand Atlas to select the targets that are absent in healthy tissues and lower the risk of toxicity.

Results and Conclusion: In total, >40000 peptide-HLAs were identified, consisting of 296 CTA-derived peptides. Across the samples, 32 peptides from MAGE-A6/8 and PRAME, vastly studied in (pre-)clinical studies, were shared across at least two cell lines and one metastatic tissue without expression in normal cells. These peptides offer translational value by eliminating residual cancer cells or micrometastases, often missed by conventional methods. Conclusively, our data nominates targets for a durable therapeutic response to treat OS and prevent metastatic progression.

POS 13

Exploring CAR T cell therapy and immunomodulatory agents in immunocompetent paediatric brain cancer models

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Background and Aim: Paediatric high-grade gliomas (pHGG) are aggressive CNS malignancies with a 5-year overall survival of ~10%, highlighting the need for novel therapies. Chimeric antigen receptor (CAR) T cell therapy has shown early clinical promise in diffuse midline glioma (DMG), with GD2-directed CAR T cells inducing tumour regression in a subset of patients. However, responses were short-lived due to limited CAR T cell persistence. Preclinical evaluation largely relies on patient-derived xenograft models lacking an intact immune system, failing to recapitulate the tumour immune microenvironment, important for CAR T cell efficacy. We hypothesise that evaluating CAR T cells in immunocompetent syngeneic models will better reflect the tumour microenrivonment and allow for the evaluation of combinational therpaies that enhance the CAR T cell efficacy.

Methods and Results: Murine glioma cell lines were engineered to express human HER2 and orthotopically implanted into neonatal immunocompetent mice or into neonatal genetically engineered mice tolerant to hHER2. The hHER2 expressing glioma cells reliably engrafted, inducing tumour formation and mortality in both the mouse strains. CD137 agonistic monotherapy induced systemic T cell activation but did not improve survival in syngeneic DMG allograft models, highlighting the need for combination therapy with tumour specific CAR T cells.

Conclusion: This neonate platform enables the evaluation of CAR T cell therapy in paediatric glioma without requiring novel antigen-specific tolerant strains. It also provides a physiologically immunocompetant relevant system to investigate strategies to enhance CAR T cell persistence and efficacy. Future work will include combining aCD137 with CAR T cells to enhance an anti tumour response.

POS 14

Identification of mechanisms underlying poor response to standard of care therapy in childhood and adolescent osteosarcoma using a novel model of in vivo acquired cisplatin resistance

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Background: Osteosarcoma (OS) is the most common primary bone tumour affecting teenagers and young adults. Neoadjuvant chemotherapy increased 5-year survival rates from 10% to 70% for patients with localised disease. However, 70% of patients will develop metastatic disease during their treatment, with 5-year survival rates of 20% for recurrent and metastatic disease, often related to the generation of treatment resistance to agents such as cisplatin. This study aimed to generate acquired resistant OS models in Non-skid gamma (NSG) mice through repeated cisplatin treatment comparable to a clinical treatment course.

Methods and Results: NSG mice were injected with 1x106 cisplatin-sensitive OS052 cells. Once tumours reached 150-200mm3, mice were randomly assigned to receive Cisplatin (6mg/kg) (n = 5) or saline (0.9%) (n = 5). Following treatment, tumours were measured daily and re-treated upon tumour progression. To prevent cumulative cisplatin toxicity, after 3 doses, tumours were digested and passaged into new NSG mice (n = 3). Resistant models were independently validated in vivo and underwent whole-genome sequencing and RNA-sequencing. We generated 4 models of cisplatin-resistant OS052 tumours. Genomic analysis revealed common CNV gains across chromosomes 8, 13 and 21. These gains overlap with the differentially expressed genes (DEGs) in our RNA-seq. Pathway analysis of DEGs showed enrichment of ion-gated channels, MYC, NOTCH and WNT, and cell motility.

Conclusion: We have generated tumours exhibiting acquired cisplatin resistance. Multi-omic analyses reveal pathways driving resistance and potential predictive biomarkers of therapeutic response. Our next steps are to use these models to investigate potential therapies identified to increase cisplatin-response.

POS 15

Identifying drivers of metastatic osteosarcoma

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Osteosarcoma (OS) is the most common bone cancer in children and adolescents. Although introduction of chemotherapy in the 1970s improved the 5-year survival rate from ~10-75%, little improvement has occurred since. Metastatic OS, most commonly to the lungs, is difficult to treat and the leading cause of death for OS patients. The 5-year survival rate for metastatic OS is <30%. One major barrier to improving metastatic OS patient outcomes is the lack of research models that accurately reflect how OS spreads. We have applied a clinically relevant model of metastatic OS in our lab. Luciferase-transduced OS cells are orthotopically (paratibial) implanted in mice to establish a primary tumour. While traditional models are limited by rapid growth of the primary tumour reaching endpoint prior to metastatic progression, our model incorporates hind-limb amputation, permitting metastatic disease progression to clinically relevant sites (lungs), monitored by in vivo bioluminescent imaging. We have established and comprehensively characterised several metastatic models of OS with histopathology, immunofluorescence, genomics and transcriptomics of primary and metastatic tumours, and assessed circulating tumour cells. RNAseq and WGS revealed transcriptomic differences and increases in SNPs and CNVs, between the primary tumour and metastatic lung lesions, providing insight into mechanisms of metastatic OS. We are undertaking in vivo genetic screens to identify drivers of metastatic OS. Data generated from these screens and our genetic and transcriptomic analyses will be harmonised with in-house and publicly available OS patient datasets and the Drug Repurposing Hub to identify clinically relevant druggable targets, potentially providing additional treatment options for metastatic OS.

POS 16

From Bench to Bedside: Repurposing Drugs for Osteosarcoma

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Background and Aim: Osteosarcoma (OS), a primary bone cancer targeting paediatric and young adult populations, presents a significant clinical challenge due to its aggressive nature, high metastatic potential, and limited treatment options. With a survival rate of approximately 35% for children with metastatic OS, no significant improvements have been made to the therapeutic strategies, making metastatic OS the primary cause of death in OS patients. Hence, drug repurposing offers an accelerated and economic process, offering a promising strategy to address this critical issue.

Methods and Results: Drug candidates for OS were identified by a literature review. Drugs were selected based on a similar mechanism of action (MOA) to the positive control, Methotrexate and those that promote bone formation by inhibiting signalling pathways overexpressed in OS. Adipose-tissue-derived mesenchymal stem cells (AT-MSCs) were isolated from patient-derived adipose tissue, and paediatric and adult OS cell lines were provided by collaborators. For each cell line and drug, cytotoxic assays determined IC50 values for monolayers and 3D spheroids at 24-, 48- and 96-hour timepoints.

Candidate drugs with a similar MOA to methotrexate demonstrated a dose-dependent reduction in OS cell metabolic activity, while the metabolic activity of AT-MSCs did not decline as that of OS cells. The IC50 values will be higher for 3D spheroids than monolayers.

Conclusion: The IC50 values identified from the cytotoxic assays will be used for functional assays to determine the proliferation, invasion and migration properties and levels of gene expression of OS cells following treatments. Overall, drugs exhibiting significant cytotoxic activity will be promising candidates for future OS therapeutics.

POS 17

Investigating resistance to tyrosine kinase inhibitors using novel CRISPR-generated models of pediatric acute lymphoblastic leukemia

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Philadelphia chromosome–like acute lymphoblastic leukemia (Ph-like ALL) is a high-risk subtype of pediatric ALL characterized by kinase-activating fusions. Despite tyrosine kinase inhibitors (TKIs) improved outcomes, resistance remains a major clinical challenge with poorly understood mechanisms, largely due to a lack of reliable cell models.

To address this, we used CRISPR to generate Ba/F3 cell models harbouring NUP214::ABL1 and SFPQ::ABL1 fusions, by introducing paired guide RNAs to induce chromosomal breakpoints at endogenous loci. In parallel, we established matched overexpression (o/e) models. Imatinib-resistant (IR) derivatives were generated through 12-month dose escalation, and confirmed with CellTiter-Glo assays.

Western blotting showed persistent pCrkL in all IR models, indicating ABL1 reactivation. However, downstream signaling was fusion-specific: NUP214::ABL1 IR cells showed broad pathway reactivation (pAkt, pStat5, and pErk), whereas SFPQ::ABL1 IR cells primarily relied on sustained pStat5. Notably, CRISPR IR models showed dasatinib cross-resistance, whereas o/e models remained sensitive.

RNA-seq revealed model-dependent resistance mechanisms. In o/e models, resistance was driven by acquired ABL1 mutations: a progressively dominant ABL1 E255K mutation in NUP214::ABL1 and a novel 32bp ABL1 deletion of SFPQ::ABL1. In contrast, CRISPR IR models lacked ABL1 mutations. They activated bypass signaling, shifting from early ERK sigaling to late-stage STAT5 and NF-κB signaling during dose escalation.
Together, ABL1 reactivation drives resistance via acquired ABL1 mutations (o/e) or non-ABL1 bypass signaling (CRISPR). These divergent mechanisms highlights the critical need for endogenous models to provide insights into TKI resistance mechanisms in Ph-like ALL.

POS 18

From Evidence to Practice: Identifying Determinants of Pharmacogenomics Implementation in Paediatric Oncology

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Background and Aim: Adverse drug reactions (ADR) affect 80% of children with cancer, causing fatalities in 10%, and 30% are left with life-long health complications at a cost of 1.2 billion to the Australian healthcare system. Up to 75% of ADRs may be avoided through pharmacogenomics (PGx), which enables genetically informed prescribing. Despite its potential to improve medication safety and effectiveness in paediatric oncology, PGx implementation remains limited. Education is frequently cited as a key enabler, however there is limited synthesis of educational gaps, barriers, enablers, and strategies supporting PGx implementation. This study aims to identify the key determinants influencing PGx implementation in paediatric practice and inform development of a theory-informed educational intervention.

Methods and Results: A systematic review of eligible studies focused on paediatric health care professional's knowledge, attitudes, and PGx education or implementation strategies. Barriers and enablers were deductively mapped to the Capability, Opportunity, Motivation–Behaviour (COM-B) framework. Of 1,728 records screened, 23 studies met inclusion criteria. Educational interventions commonly improved clinician capability, particularly PGx knowledge and confidence; however, implementation was constrained by opportunity and motivation barriers, including lack of decision-support tools, funding constraints, and poor workflow integration. Phase two will involve stakeholder interviews at a tertiary paediatric hospital.

Conclusion: PGx education improves knowledge but insufficiently addresses system-level barriers limiting implementation. A theory-informed, behaviourally grounded approach is required to support sustainable integration into paediatric oncology practice.

POS 19

Fertility Options for Children, Adolescent and Young Cancer Survivors: Focus Trial Study Protocol

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Background: Survival rates of children, adolescents, and young adults (CAYA) with cancer exceed 80%. However, gonadotoxic treatment may impair future fertility. Fertility preservation is possible but, lack of fertility information is an unmet need at diagnosis and survivorship. Fertility preservation Decision aids (FPDA) support informed, value-based fertility decisions; but, evidence on their effectiveness in survivorship is limited. This protocol aims to describe a randomised controlled trial evaluating the effect of an FPDA on unmet fertility information needs among CAYA survivors diagnosed before age 25 (aged 16 and older) and their parents.

Methodology: FPDA development was informed through co-design process. The FPDA will be evaluated in a parallel-group, double-blind, randomised controlled trial. 358 cancer survivors and parents will be recruited through social media and randomised 1:1 to the control or intervention arm. The Control Group will receive high-quality information. The Intervention Group will receive both high-quality information and the FPDA. This study is funded by the Medical Research Future Fund (MRFF000308) and registered (NCT0689481).

Results: Recruitment started in December 2025. At baseline, participants complete surveys capturing sociodemographics and other information. Eight-weeks and six-months post-intervention, follow-up surveys assess unmet fertility information needs.

Conclusion: This study is the first to evaluate the impact of a FPDA on unmet fertility information needs in CAYA survivors and parents. Grounded in extensive previous co-design of a FPDA work, the trial will provide high-quality evidence on the tool's impact and inform strategies for broader clinical and digital implementation.

POS 20

The physically vulnerable child with cancer: what are the features, and what can we do?

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Background and Aims: Children undergoing cancer treatment show early signs of frailty, associated with long-term morbidity. In adult oncology, frailty frameworks guide supportive care and help identify patients needing intervention. Paediatric equivalents are lacking. A clearer understanding of physical vulnerability in childhood cancer is needed to strengthen supportive-care pathways. We explored the concept of the "physically vulnerable child" in paediatric oncology, described key clinical features, contributing factors, and approaches to assessment and management.

Methods and Results: A qualitative study. Two focus groups included international physiotherapists, exercise physiologists, and researchers. Data analysed thematically. Ten clinicians participated across two focus groups. Three themes conceptualised physical vulnerability: (1) clinical presentation, (2) contributing factors, (3) strategies for monitoring and intervention. Vulnerable children have limited physical and psychological reserves, reduced tolerance to treatment cycles and complications, increased reliance on caregivers and medical supports, and restricted participation in normal activities. Contributors spanned treatment-related toxicities, child and family characteristics, behavioural factors, and the broader clinical environment. Proactive detection and surveillance models of care were potential avenues for early, targeted intervention.

Conclusion: Physical vulnerability is a multifaceted and dynamic construct shaped by medical, psychosocial, and contextual influences. Adult frailty frameworks need careful modification for paediatrics. Findings will inform development of a paediatric cancer–specific vulnerability framework and guide future supportive-care interventions for at-risk children.

POS 21

Using Behaviour Change Theory and Consumer Partnerships to Design Pre/Rehabilitation Services for Children at Risk of Toxicity: Design and Application of the POPP Framework

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Background & Aims: Childhood cancer survivors have increased risk of chronic disease and premature mortality. Current knowledge highlights the importance of physical activity (PA) for children with cancer. Yet, services to promote PA are absent in many settings. This study aims to 1. Describe the design, and components of the Paediatric Oncology Physical Activity Promotion (POPP) framework – a framework that guides how to implement clinical services to improve PA engagement, 2. Use the framework to design rehab/prehabilitation programs in partnership with consumers.

Methods & Results: A series of studies were conducted: two systematic reviews, qualitative study1, and a PA intervention (CanMOVE)2 design and feasibility trial. The POPP framework design process synthesised these results, with behaviour change theory, current literature and guidelines. To improve PA engagement for children with cancer, the POPP framework proposes the implementation of strategies across several domains: family education, environmental and organisational strategies; routine screening of physical impairments; structured pre/rehabilitation pathways for high-risk toxicity groups. PA-informed models of care should be: Proactive: offered at diagnosis; Needs-based: tailored to need; Ongoing: available throughout all treatment/post-treatment phases; Integrated: embedded as standard care. The framework is now being used in conjunction with co-design principles to design and pilot pre/rehabilitation programs for high-risk toxicity groups; including: early muscle toxicity (sarcopenia), HSCT prehabilitation, and high-risk cardiotoxicity.

Conclusion: The POPP framework can guide health services design to reduce the impact of treatment related toxicity and improve long term health outcomes.

POS 22

Exploring Pediatric Cancer Patients' and Survivors' Experiences With Physical Activity: Results From a Meta-Synthesis of Qualitative Studies

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Background and Aims: Children with cancer experience physical and psychosocial, and reduced QOL. Physical activity (PA) is a safe and effective supportive-care strategy, yet participation remains low and determinants of engagement are poorly understood. Understanding lived-experiences is critical to informing feasible, family-centred PA programs.

Methods and Results: A meta-study methodology was used. Data was analyzed using descriptive statistics and narrative synthesis. 27 studies (n=798 participants) were included. Two overarching categories emerged: (1) PA experiences and (2) factors influencing PA. Children described a dynamic range of PA experiences across treatment and survivorship. Negative experiences—reduced strength, fitness, coordination, loss of confidence, frustration—could diminish motivation and lead to withdrawal from PA. Positive experiences—improved energy, strength, mood, confidence, social connection, and sense of normalcy—reinforced engagement. PA experiences were shaped by individual (beliefs, preferences, knowledge), interpersonal (family, peers, healthcare providers), and environmental (treatment stage, hospital setting) factors. These elements interacted cyclically to influence ongoing participation. PA interventions were viewed positively. Practical implications for PA-intervention design, 1. include activities that are fun, individualised and developmentally appropriate, 2. support self-monitoring, 3. involve families and healthcare providers.

Conclusions: PA-interventions offer a clear avenue to strengthen supportive care in pediatric oncology. Complex interventions and strong clinical implementation are needed to embed PA into routine care, enhance motivation, and improve functional, psychosocial, and QOL outcomes.

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