

SickKids
VS

Qais,
SickKids patient

THE GREAT CYCLE CHALLENGE

Thank you for helping us
diagnose faster, treat smarter,
and predict better.



DECODING DNA

Understanding the genetic changes that drive cancer

Researchers can now identify thousands of genetic changes in a child's DNA. But finding a change is only the beginning. One of the biggest challenges in precision medicine is determining what those changes mean: Which are harmless, and which could play a role in causing cancer?

With support from the Great Cycle Challenge, Dr. Jason Moffat, Senior Scientist and Program Head of Genetics & Genome Biology at SickKids Research Institute, and his team are working to answer that question using CRISPR prime editing. This advanced genome-editing technology allows researchers to make precise changes to DNA and study their effects.

The team is focusing on POLE, a gene that helps copy DNA and correct errors that occur in the process. While certain POLE variants are known to be associated with cancer, the significance of many others remains unclear. By recreating and testing many of these variants at once, Dr. Moffat's team can investigate which ones disrupt normal cell function and may contribute to disease.

The findings could help scientists interpret genetic information with greater accuracy, providing important new insight into how some

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cancers develop and which genetic changes warrant closer attention.

This work also has implications beyond SickKids. By generating evidence for researchers and clinicians studying childhood cancer across Canada, the team is contributing to a broader effort to harness genomics and precision medicine to advance cancer research and care.

Great Cycle Challenge riders and supporters are helping make this foundational research possible, giving scientists new tools to uncover the biology of childhood cancer and laying the groundwork for more precise approaches to diagnosis and treatment in the future.

KURSTEN'S STORY

Kursten is a creative, energetic young girl who loves soccer, dancing, singing, baking and spending time with her two younger brothers. In November 2025, her life changed suddenly when severe pain made it increasingly difficult for her to walk. Just weeks later, she was diagnosed with Ewing sarcoma at SickKids.

Treatment began quickly. Kursten has since faced chemotherapy, blood and platelet transfusions, and repeated hospital stays for pain, fever and other complications. There have been very difficult times, including losing her hair and spending Christmas, New Year's and her brother's birthday in hospital. But there has also been important progress. Kursten has regained her ability to walk, climb stairs and enjoy short outings with her family.

Through it all, she continues to find reasons to smile, whether she is making crafts, playing with her brothers or chatting with her nurses she has come to know so well.

Kursten is also helping advance childhood cancer research. She is participating in two SickKids studies that use tissue from her biopsy and medical data to help researchers better understand cancer and improve care for children in the future.

Kursten still has treatment ahead. For Great Cycle Challenge riders and supporters, Kursten is one of the children at the heart of this work. Your support helps fuel the research and care that give children like Kursten more possibilities for the future.



Kursten,
SickKids patient

EXPANDING ACCESS TO CARE

Clinical trials: an option for all Canadian children

For children with high-risk neuroblastoma, one of the most aggressive childhood cancers, clinical trials are critical to finding treatments that can improve outcomes while reducing the potential burden of therapy.

Thanks to Great Cycle Challenge supporters and participants, SickKids is contributing to an international Phase III clinical trial for children with newly diagnosed high-risk neuroblastoma. The study is evaluating whether adding targeted MIBG therapy to intensive treatment can improve outcomes for children whose cancer carries a particularly high risk of returning. SickKids is one of only a few centres in Canada able to provide

MIBG therapy for children with high-risk neuroblastoma, providing access to this highly specialized treatment for children from across the country.

MIBG is a form of targeted radiation therapy that takes advantage of a characteristic of most neuroblastoma cells: their ability to absorb MIBG. When MIBG is combined with radioactive iodine, radiation can be delivered directly to cancer cells throughout the body, limiting exposure to surrounding healthy tissue. While ANBL1531 is open at multiple centres across Canada, delivering MIBG therapy requires highly specialized facilities and expertise. SickKids is the only Canadian centre able to provide this component of the trial, serving both children treated here and those referred from participating hospitals elsewhere in the country.

This model extends the reach of specialized research and care far beyond SickKids. Children can remain connected to their home oncology teams while accessing a therapy that would otherwise not be available to them in Canada. At the same time, their participation contributes to an international effort to determine whether this approach can improve treatment for future generations of children with high-risk neuroblastoma.

Support from Great Cycle Challenge is helping SickKids turn highly specialized expertise into broader impact by connecting children across Canada to leading-edge clinical research and building the evidence for better personalized treatments worldwide.



Nori,
SickKids patient

PEDALLING FOR PROGRESS

Precision medicine. Better outcomes.

Paediatric low-grade gliomas (pLGG) are the most common brain tumours. While survival rates are high, these tumours can be difficult to control. More than half of patients experience tumour progression within 10 years, and some children face multiple recurrences and courses of treatment over years.

For children receiving chemotherapy or targeted therapy, regular MRI scans are essential to determine whether treatment is working. Today, response is largely assessed by comparing tumour size across scans, with neuroradiologists manually measuring changes over time. But these measurements can vary, and changes in tumour size may not provide the earliest indication of how well a child is responding.

With support from Great Cycle Challenge donors and participants, SickKids researchers are developing AI tools that can extract far more information from MRI images. The goal is to identify imaging patterns that can predict a child's response to treatment as early and accurately as possible and ultimately determine how frequently each individual child needs to be scanned.

The potential impact is significant. Earlier insight into whether a therapy is working could allow care teams to adjust treatment sooner, avoiding valuable time on an ineffective therapy. More personalized monitoring could also reduce the number of MRI scans some children require. This is particularly important for younger patients, who may need sedation for each scan, and could help ease the anxiety and disruption that come with repeated hospital visits.

By combining advanced imaging, artificial intelligence and deep expertise in childhood brain tumours, this research aims to make treatment monitoring more precise and personalized. The result could be better-informed treatment decisions for children today and a new approach to following children with pLGG in the future.



Tyler,
SickKids patient



THANK YOU

Thank you for supporting SickKids and our mission to Heal the Future. Donors like you make this possible.

For more information, please contact:

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