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Researchers shed light on genetic mechanisms of Wilms tumor

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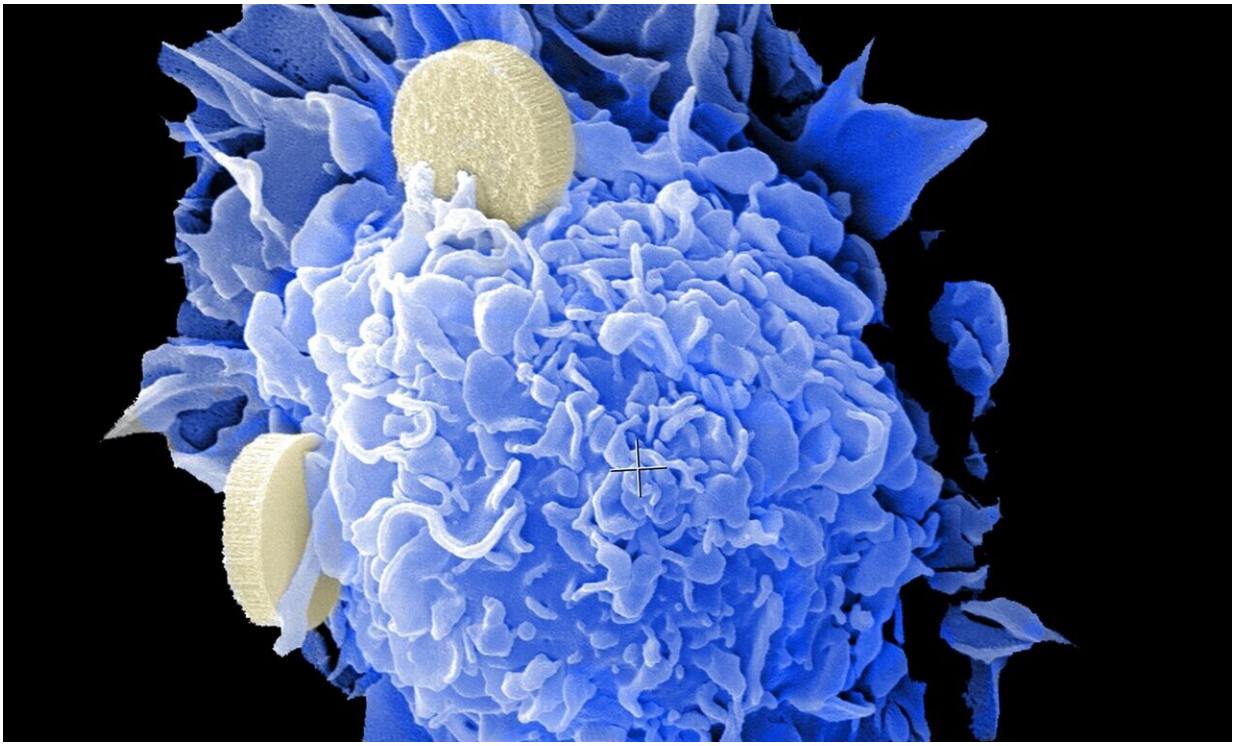

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New research from Ann & Robert H. Lurie Children's Hospital of Chicago and collaborators from other institutions provides insights into some of the genetic characteristics resulting in the development of relapse in patients with Wilms tumor (nephroblastoma), the most common type of pediatric cancer of the kidney. The study published in

Cell Reports Medicine identified mutations in key genes, including two that had not been previously recognized in Wilms tumor, which offers promise for improving ways to better identify patients who are at risk of relapse and tailoring therapies for these patients.

There are two major types of Wilms tumor based on their histology, or how they look under a microscope. Approximately 95 percent of Wilms tumors have a favorable histology, and the overall survival rate of children with tumors of this type is 90 percent. Unfavorable histology, or anaplasia, describes tumors with increase in cell size, increased irregularity in the shape of the cells, and abnormalities of DNA. These tumors are more difficult to treat. Even though children with favorable histology Wilms tumor have a very high rate of overall survival, they still require treatment with chemotherapy, and often with radiation as well.

To gain a better understanding of the genetic mechanisms of relapse in Wilms tumors, the researchers conducted genetic sequencing of samples from primary and relapse tumors as well as normal kidney or peripheral blood samples of patients with favorable histology Wilms tumor who relapsed following therapy. The patients were part of the Children's Oncology Group AREN03B2 umbrella biology and classification study from 2006 to 2017.

"One of the remarkable characteristics of this study is that it is a comprehensive analysis of the largest number of relapse samples of Wilms tumor to date," said lead author Elizabeth J. Perlman, Head of the Department of Pathology and Laboratory Medicine, Arthur C. King Board Designated Professor at Lurie Children's Hospital, and Professor of Pathology at Northwestern University Feinberg School of Medicine. "We were also able to build upon current evidence suggesting that genetic variants may play key roles in tumor evolution."

More information: Samantha Gadd et al, Genetic changes associated

with relapse in favorable histology Wilms tumor: A Children's Oncology Group AREN03B2 study, *Cell Reports Medicine* (2022). DOI: 10.1016/j.xcrm.2022.100644