

# Researchers reveal predictive staircase to leukemia

January 11 2016

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McMaster University researchers have taken a giant leap in identifying the early stages of a deadly cancer and predicting how it will develop in individuals.

"We've found that the transition from healthy to cancerous [blood](#) stem cells happens in clear, compartmentalized steps," said Mick Bhatia, principal investigator of the study and director of the McMaster Stem Cell and Cancer Research Institute. "We've identified two steps in that staircase."

In the paper published today by the scientific journal *Cancer Cell*, the researchers detail how they have been able to fingerprint myelodysplastic syndromes (MDS), a state for [blood cells](#) that turns into [acute myeloid leukemia](#) (AML) [cancer](#) in approximately 30% of [patients](#). The study demonstrates that early and accurate prediction of this aggressive cancer is possible.

AML is the most common type of leukemia in adults, and about 1,300 Canadians are expected to develop the disease each year.

Bhatia's research team found when they deleted one version of the important GSK-3 gene, the other version of the gene became active but remained non-cancerous. However, when the second version of the gene was also deleted, AML cancer began.

To test this, Bhatia's team collaborated with Italian researchers at the

University of Bologna to apply these initial findings to human blood samples that had been previously collected from patients with MDS, some of whom eventually developed AML. McMaster researchers did a retroactive study, and demonstrated that gene expression analysis of patient blood samples was accurate in predicting which patients would develop AML and which would not.

"This discovery improves our ability to identify which patients with MDS will develop AML," said Bhatia. "However, our next step is to go beyond better predictive measures for the development of a blood cancer, and use this predictive gene expression as a target for drugs to prevent AML from developing altogether. This will be part of a new era of genetic-based drug discovery."

Provided by McMaster University

Citation: Researchers reveal predictive staircase to leukemia (2016, January 11) retrieved 25 April 2024 from <https://medicalxpress.com/news/2016-01-reveal-staircase-leukemia.html>

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