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Discovery of a gene associated with a leukemia mostly affecting children

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Cyndia Charfi, a Ph. D student in biology at the University of Quebec at Montreal (UQAM), supported by her thesis supervisors, Professor Éric Rassart, and Adjunct Professor Elsy Edouard, UQAM, Department of Biological Sciences and BIOMED Research Centre, made a major breakthrough in research on B-cell acute lymphocytic leukemia, a disease that occurs most commonly in children. She has successfully identified a gene that may facilitate the diagnosis of this cancer, which is characterized by an abnormal proliferation of B-cells, antibody-producing cells that defend the body against infection. Her findings were recently published in the prestigious scientific journal *Blood*.

Cyndi Charfi first compared the transcriptome (the set of active genes in a cell) of leukemic and healthy mice. From this analysis, she was able to isolate groups of genes with abnormal activity in the leukemic mice. This led to the discovery that excessive synthesis of the Fmn2 gene and protein is associated with B-cell lymphocytic leukemia.

Although mice cells are genetically similar to human cells, they clearly are not identical. So the young researcher continued her work, this time using human cells. Her results were the same: abormal activity of Fmn2 gene was observed in human patients with B-cell lymphocytic leukemia and particularly in children.

Leukemia refers to all cancers that attack the bone marrow cells. The bone marrow produces blood cells, hence the term "blood cancer". As there are several types of blood cells (including B-cells), there are also

several types of leukemia, and the treatment differs for each type. The faster and more accurate the diagnosis of the type of leukemia, the better the treatment.

What is the significance of this discovery? According to Professor Rassart, "although it is basic research, Cyndia Charfi's findings represent a major advance and a step closer to improved diagnosis and, hopefully, treatment of this cancer, whose victims, we should recall, are mainly children."

More information: The results of Cyndi Charfi's research are published in the December 2010 issue of Blood under the title "Gene profiling of Graffi murine leukemia virus induced lymphoid leukemias: identification of leukemia markers and Fmn2 as a potential oncogene."

Provided by University of Quebec at Montreal