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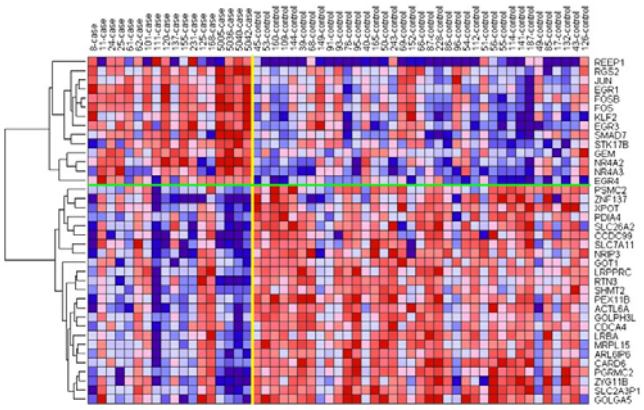
City of Hope
NATIONAL MEDICAL CENTER AND
BECKMAN RESEARCH INSTITUTE

Gene Signatures for Prediction of Therapy-Related Myelodysplasia



DESCRIPTION

Therapy-related myelodysplasia or acute myeloid leukemia (t-MDS/AML) is a lethal complication of cytotoxic chemotherapy treatment for cancer. t-MDS/AML accounts for 15% of all AML and MDS cases and is a leading cause of non-relapse mortality among patients undergoing autologous hematopoietic cell transplantation for Hodgkin lymphoma or non-Hodgkin lymphoma (NHL). Because t-MDS/AML may not present with symptoms until years after cancer treatment is administered, it is paramount that patients who are at risk for developing this complication be properly monitored. However, at present, the process of monitoring such patients is inherently inefficient. Because less than 9% of treated lymphoma patients go on to develop t-MDS/AML, closely observing all patients for so many years creates a costly burden on the healthcare system and has limited benefits. The alternative, decreasing the frequency and intensity of monitoring efforts, puts 9% of patients at risk of this deadly complication.

Based on intensive analysis of lymphoma patient samples and their long term outcomes, City of Hope has developed a new technology that will help physicians identify which patients are at risk of developing t-MDS/AML after cytotoxic chemotherapy. Changes in gene expression, which are caused by these cytotoxic therapies and precipitate t-MDS/AML, are present in hematopoietic stem cells long before any physiologic symptoms of t-MDS/AML appear. Using bone marrow samples from treated lymphoma patients and an expression array for 38 genes involved in cell adhesion, cell cycle, mitochondrial and metabolic pathways, this technology accurately predicts each patient's individual risk level and thereby helps physicians initiate long-term monitoring efforts and preventative care for those patients who are likely to develop the disease.

KEY ASPECTS

- 38 gene expression array for accurately predicting therapy-related myelodysplasia following lymphoma treatment
- 95% specificity and 87.5% sensitivity

INTELLECTUAL PROPERTY

Title	Patent Application	Filed
Gene Signatures for Prediction of Therapy-Related Myelodysplasia and Methods for Identification of Patients at Risk for Development of the Same	PCT/US11/64040	12/8/2011

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