Researchers identify key role of microRNAs in melanoma metastasis

July 11 2011

Researchers at the NYU Cancer Institute, an NCI-designated cancer center at NYU Langone Medical Center, identified for the first time the key role specific microRNAs (miRNAs) play in melanoma metastasis to simultaneously cause cancer cells to invade and immunosuppress the human body's ability to fight abnormal cells. The new study is published in the July 11, 2011 issue of the journal *Cancer Cell.*

Researchers performed a miRNA analysis of human melanoma tissues, including primary and metastatic tumors. They found in both sets of tumor cells significantly high levels of a cluster of two miRNAs called miR-30b and miR-30d (miR-30b/30d). Higher levels of miR-30b/30d in melanoma tumor cells were linked to advanced stages of cancer, tumor progression, potential metastasis and reduced overall patient survival.

"Melanoma patients with higher levels of these miRNAs in their tumor cells are at greater risk for melanoma metastasis from their primary tumor," said Eva Hernando, PhD, senior author of the study and assistant professor in the Department of Pathology at NYU Langone Medical Center.

In the study, the benefit of silencing miRNAs in melanoma tumor cells was tested. This experiment led to the successful suppression of cell invasion, migration and metastatic melanoma. In addition, the study shows the over expression of miRNAs in tumor cells suppresses the normal function of GALNT7, an enzyme that modifies proteins on the surface of cells to control cell communication, cell migration and

immune system surveillance. These miRNAs inhibit the role of GALNT7 in tumor cells leading to the spread of cancer.

"Our study results may have a direct clinical implication on the management of melanoma patients since these miRNAs can potentially serve as a new biomarker of a more aggressive tumor," said Avital Gaziel-Sovran, lead author of the study and NYU graduate student who conducted many of the experiments.

Melanoma is the deadliest form of skin cancer and one of the most invasive and aggressive tumor types. In the study, miRNAs were identified as strong promoters of the metastatic behavior of melanoma cells. miRNAs are the short pieces of RNA that regulate gene and cellular activities and are known to be linked to cancers like melanoma. However, this new research shows how these miRNAs increase melanoma cells' capacity to migrate, spread and metastasize.

"This study adds another piece to the melanoma puzzle showing how a few millimeter lesion on the skin's surface can quickly metastasize by invading other parts of the body like the lungs and brain so aggressively," said Dr. Hernando, a member of the Melanoma Program at the NYU Cancer Institute and the Center of Excellence on Cancers of the Skin at NYU Langone. "This study helps us better understand exactly why melanoma is so metastatic and suggests how miRNAs are a new potential therapeutic target for battling the disease."

Provided by New York University School of Medicine