

MicroRNA molecule found to be a potent tumor-suppressor in lung cancer

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New research shows that microRNA-486 is a potent tumor-suppressor molecule in lung cancer, and that it helps regulate the proliferation and migration of lung-cancer cells, and the induction of programmed cell death, or apoptosis, in those cells.

The preclinical study was led by researchers at the Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James). It found that microRNA-486 (miR-486) directly targets the insulin growth-factor pathway, which is important for [cell survival](#) and proliferation. Alterations in the pathway are believed to play an early role in [tumor initiation](#) and progression.

The researchers further found that miR-486 is itself regulated by the tumor-suppressor [gene p53](#), the most frequently altered gene in human cancers, and that activity of miR-486 is partially dependent upon functional p53.

Published in the *Proceedings of the National Academy of Sciences*, the study suggests that miR-486 might serve as a biomarker for lung-cancer patients who might respond to treatment with insulin-growth-factor inhibitors.

"It wasn't known whether miR-486 functioned as an oncogene or a tumor-suppressor gene in lung cancer," says co-corresponding author Patrick Nana-Sinkam, MD, associate professor of medicine and a researcher with the OSUCCC – James Molecular Biology and Cancer Genetics Program.

"miR-486 appears to be a biomarker for lung cancer, but its mechanisms of action remain unclear," he says. "These findings show that miR-486 serves a tumor-suppressor function in lung cancer, and that miR-486 action is partially dependent on p53."

"This partial reliance of one tumor-suppressor on another was a surprise," says principal investigator and co-corresponding author Carlo M. Croce, MD, director of Ohio State's Human Cancer Genetics program and the John W. Wolfe Chair in Human Cancer Genetics at the OSUCCC – James. "We don't know yet what implications, if any, this might have for the development of targeted therapies."

MicroRNAs are a class of short, non-coding RNAs that regulate the translation or degradation of messenger RNA and therefore the proteins that cells make. Research is showing that certain microRNAs are frequently dysregulated in cancer.

Nana-Sinkam and his colleagues examined lung-tumor samples from 81 patients with stage-1 nonsmall-cell lung cancer and tumor-cell lines. Analyses identified miR-486 as the most decreased of microRNAs in the cells, so the researchers chose it for further investigation.

Provided by Ohio State University Medical Center

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