New gene linked to lung cancer spread and tumor formation

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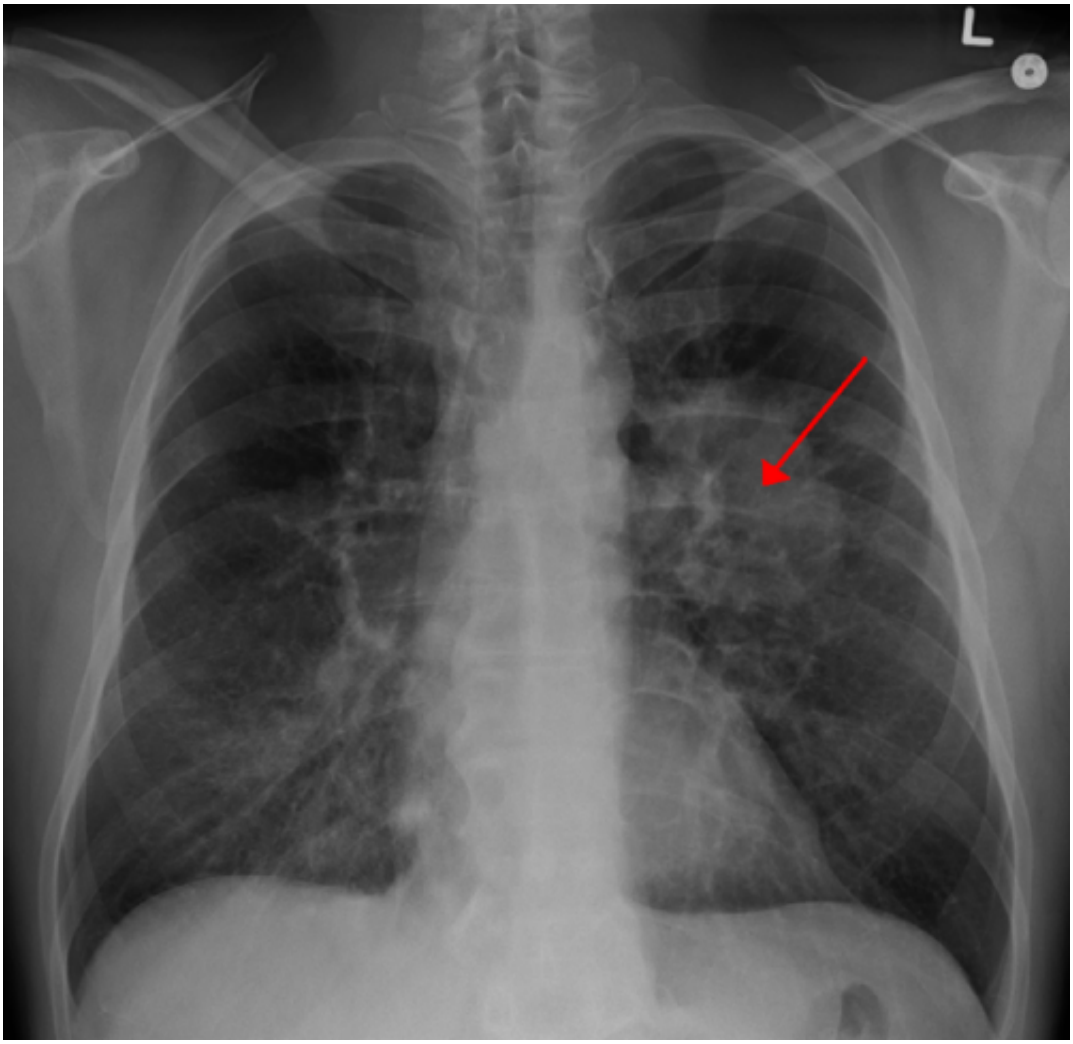

Lung CA seen on CXR. Credit: CC BY-SA 4.0 James Heilman, MD/Wikipedia

Worldwide, lung cancer causes more deaths than any other cancer. Most frequently, mortality is the result of metastasis—when lung cancer spreads to other parts of the body, such as the brain, bones or liver.

In a new study, Northwestern Medicine scientists showed for the first time that the Myosin 9b gene is correlated with lung cancer tumor formation and metastasis.

Myo9b, the protein that the gene encodes, was seen in approximately 90 percent of lung cancer tissue samples in the study, and higher levels of it predicted shorter patient survival. The finding suggests reducing or silencing expression of Myo9b in cancer cells could help patients suffering from metastatic lung cancer.

"Elevated Myo9b expression is associated with fast lung cancer progression and poor prognosis," said principal investigator Dr. Jane Wu, the Dr. Charles L. Mix Research Professor of Neurology and Psychiatry at Northwestern University Feinberg School of Medicine. "These observations suggest the exciting possibility of developing Myo9b as a new biomarker for cancer, especially lung cancer."

The study, published Nov. 3 in the *Journal of Clinical Investigation*, builds on previous research showing that a family of genes called SLIT are involved in tumor suppression in breast, brain and pancreatic cancers. Collaborating with investigators in China, Wu's team first demonstrated that the Slit2 gene reduces tumor formation and metastasis in both cell cultures and mouse models of lung cancer.

"A large number of lung cancer-associated genes have been discovered," Wu said. "However, the naturally existing genes and gene pathways that suppress lung cancer progression and metastasis remain poorly understood."

So, the scientists next studied the gene signaling pathway that enables Slit2 to suppress cancer cell migration. They found the new player: Myo9b, a protein previously seen solely in immune cells. Wu's group not only detected Myo9b in lung tissue cancer cells, they also discovered that there was too much of it in the majority of the lung cancer samples surveyed.

Patients with elevated levels of Myo9b expression may benefit from treatment that suppresses the protein's function.

"Our study provides new insights into the molecular and cellular mechanisms underlying lung cancer invasion and metastasis, a critical process that often leads to fatal consequence," Wu said. "Our data also provide a solid foundation for developing new diagnostic and therapeutic tools for lung cancer."

Provided by Northwestern University

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