

Combination drug therapy urged to battle lung cancer

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Combination drug therapy may be needed to combat non-small cell lung cancer (NSCLC), according to a study by the Translational Genomics Research Institute (TGen) and Van Andel Research Institute (VARI).

The study, "STAT3 is Activated by JAK2 Independent of Key Oncogenic Driver Mutation in Non-Small Cell Lung [Carcinoma](#)," was published online today, Feb. 2, 2012, by the [PLoS ONE](#).

The study found that in NSCLC — the most common form of [lung cancer](#) — that the STAT3 gene is activated in some NSCLC cell lines by the JAK2 protein. This signaling can play a crucial role in tumor-cell behavior that may not be effectively inhibited by drugs that selectively target these mutations, the study concluded.

"This suggests that there may be a potential role for combination therapy, so you have a better chance of knocking out select NSCLC tumors driven by STAT3-JAK2, or keeping it at bay," said Dr. Glen Weiss, Co-Unit Head of TGen's Lung Cancer Research Laboratory and Director of Thoracic Oncology at Virginia G. Piper Cancer Center Clinical Trials at Scottsdale Healthcare, a partnership between [TGen](#) and Scottsdale Healthcare that treats cancer patients with promising new drugs.

The JAK2 protein can activate the gene called STAT3, part of a family of genes that provide instructions for making proteins that are part of the essential chemical signaling pathways that control growth and

development in cells. STAT3 has been found to be overactive in cases of several types of cancer, including breast, prostate, pancreas, leukemia and lymphoma.

In laboratory tests involving seven NSCLC cell lines, the TGen-VARI study found that [STAT3](#) was activated in some cell lines by JAK2, independent of key oncogenic, or potentially cancer-causing, genes.

"JAK2-STAT3 signaling plays crucial roles in tumor-cell behavior that may not be effectively inhibited by drugs that selectively target these [mutations](#)," said Dr. Jeff MacKeigan, Head of VARI's Laboratory of Systems Biology. VARI is TGen's affiliate in Grand Rapids, Mich.

This study, funded by a TGen-VARI integration grant, should benefit future lung cancer research because of the study's clinically annotated tissue microarray, MacKeigan said.

Provided by The Translational Genomics Research Institute

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