

Misregulated genes common to tobacco-related cancers offer potential new prognostic tool

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Believe it or not, while researchers have explored which genes are mutated in each type of tobacco-associated cancer, until now no one had thought to look across these types for common genes that might predict patient outcomes. Results presented at the AACR Annual Meeting 2013 show that in lung and bladder cancers, genes related to the regulation of the cell cycle are associated with poor patient outcomes.

"We ultimately envision this as a prognostic tool to predict survival rates for people with tobacco related cancers. Recognizing patients with high expression of these genes could help us predict risk and so match patients with the most appropriate treatments," says Garrett Dancik, PhD, postdoc in the lab of Dan Theodorescu, MD, PhD, director of the University of Colorado Cancer Center.

The study mined data from publicly-available tumor registries that included a total of 1996 samples of cancer types including lung adenocarcinoma, squamous cell [lung carcinoma](#), bladder [transitional cell carcinoma](#), and head and neck [squamous cell carcinoma](#). The question was this: what common genetic signatures would correlate with patient outcomes? Interestingly, researchers had previously asked this question of prostate cancer and had developed a panel of 31 cell-cycle related genes that predict the aggressiveness of the disease. Once Dancik and Theodorescu narrowed in on pathways controlling cell cycle as possibly predictive in tobacco-related cancers, they wondered if the same 31-gene

panel might work with these cancers as well.

"Take out the [squamous cell cancers](#) and the panel is strongly predictive of patient outcomes," Dancik says. "This is a strong tool that could have a really useful application – only it seems there's something unique going on with the squamous cell types of tobacco-associated cancers that's not true for the others."

In Dancik's opinion, the discovery of correlation between cell cycle gene signatures and patient outcomes is an important first step in developing new ways to predict the risks of tobacco-associated cancers. The work now is in integrating this finding with existing risk assessments.

Provided by University of Colorado Denver

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