

# Cancer researchers PTEN discovery provides knowledge to individualize treatment

25 July 2013

Scientists at the Princess Margaret Cancer Centre have discovered a function of the tumor suppressor gene PTEN that helps explain why certain promising therapies fail in many cancer patients, a finding that could aid in delivering tailored, personalized cancer medicine based on an individual's genetics.

The research, published online today in *Science*, "increases understanding of the molecular mechanisms of action of PTEN, which is known to be defective in as many as half of all advanced cancers" says principal investigator Vuk Stambolic, Senior Scientist at the Princess Margaret Cancer Centre. Dr. Stambolic, a specialist in cell signalling, is also an Associate Professor in the Department of Medical Biophysics, University of Toronto.

In the lab, working with cell and animal models of cancer, the research team discovered what happens when the protein product of PTEN is lost or deregulated. Dr. Stambolic says: "We realized that the PTEN nuclear function links this tumor suppressor to the response to conventional [cancer](#) treatments, such as chemotherapy or radiation. This new knowledge, combined with our prior understanding of PTEN, provided immediate clues for individualizing therapy for patients with PTEN-deficient tumors."

Medical oncologist Lillian Siu, who leads numerous clinical trials at Princess Margaret, but was not directly involved in this research, says: "For clinicians, this is a significant finding that could help guide treatment decisions, especially considering that we can already test for PTEN deficiency by molecularly analyzing biopsied tissue, providing a biomarker for implementation of combined therapies that may be most effective."

For Dr. Stambolic, the discovery builds on his

earlier research (*Cell*, 1998) which helped explain how PTEN loss promotes [cell survival](#), another key feature of [cancerous cells](#). "We now realize that the PTEN story was only half-told in 1998," says Dr. Stambolic. "The new findings, in conjunction with advances in molecular profiling and access to drugs already available or being tested in clinical development, present a tangible scenario to tailor treatment."

**More information:** "Second Role for Anti-Tumor Gene Identified", *Science* vol 341 26 July 2013

Provided by University Health Network

APA citation: Cancer researchers PTEN discovery provides knowledge to individualize treatment (2013, July 25) retrieved 2 August 2022 from <https://medicalxpress.com/news/2013-07-cancer-pten-discovery-knowledge-individualize.html>

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