

A way to kill chemo-resistant ovarian cancer cells: Cut down its protector

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Electron microscopic image of a single human lymphocyte. Credit: Dr. Triche National Cancer Institute

Ovarian cancer is the most deadly gynecological cancer, claiming the lives of more than 50% of women who are diagnosed with the disease. A study involving Ottawa and Taiwan researchers, published today in the influential *Proceedings of the National Academy of Sciences (PNAS)*, provides new insight into why ovarian cancer is often resistant to chemotherapy, as well as a potential way to improve its diagnosis and treatment.

It is estimated that 2,700 Canadian women will be diagnosed with [ovarian cancer](#) in 2014 and that 1,750 Canadian women will die from the disease, according to Ovarian Cancer Canada. This cancer is often diagnosed late and develops a resistance to chemotherapy.

"What we've discovered will help clinicians to better treat women with ovarian cancer," says Dr. Ben Tsang, senior scientist at the Ottawa Hospital Research Institute and professor at the University of Ottawa. "The key is understanding the role of a protein called gelsolin. With our colleagues from National Cheng Kung University in Taiwan, we found that an increased level of this protein is associated with aggressive forms of ovarian cancer that are more likely to be resistant to chemotherapy and lead to death."

The researchers showed how gelsolin works at the molecular level to protect cancer cells against a widely used chemotherapy drug called cisplatin.

The findings are important because they will help clinicians to determine the most effective treatment plan based on the level of gelsolin. Work still needs to be done to determine exactly how much gelsolin indicates a cancer that is chemo-resistant and would require different treatment options.

In addition, this same protein that makes ovarian cancer cells resistant to

chemotherapy can be used to overcome this treatment obstacle. By cutting gelsolin down to a specific fragment and putting it into chemo-resistant [cancer cells](#), the international team discovered they could make these cells susceptible to the cancer-killing effects of cisplatin.

"We believe this discovery is a promising avenue for developing a new therapy to reduce chemo-resistance in women with this deadly disease," said Dr. Dar-Bin Shieh, collaborative partner from National Cheng Kung University of Taiwan. Shieh is currently leading the International Institute of Macromolecular Analysis and Nanomedicine Innovation (IMANI), which is focused on translating molecular discoveries to the clinic.

Based on 2009 estimates, approximately one in 72 Canadian [women](#) will develop ovarian cancer in her lifetime and one in 93 will die from it.

More information: Cell Fate Regulation by Gelsolin in Human Gynecologic Cancers, *PNAS*,
www.pnas.org/content/early/2014/09/19/1401166111

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