

Chemotherapy and herpes can help fight cancer, study finds

November 20 2013, by Chantall Van Raay

(Medical Xpress)—Combining chemotherapy with a herpes virus has shown promise in killing cancer cells and tumours during initial testing, two complementary McMaster studies have found.

Led by postdoctoral researcher Sam Workenhe, the findings were published in the scientific journals *Molecular Therapy* and *Cancer Immunology Research*. The approach is a novel way to directly target tumour cells and activate the immune system, he explained.

"Cancer cells are constantly evolving to outsmart the body's immune response," said Workenhe. "Effective [cancer](#) therapies target tumour cells directly and initiate an 'anti-tumour' immune response that targets [tumour cells](#), even in the absence of the original therapeutic agent."

As part of the study, researchers genetically engineered Herpes simplex viruses (HSVs) in a way that makes them replicate in and ultimately kill [cancer cells](#).

"In our first study, we used HSV-1 and HSV-2 oncolytic viruses to activate the immune response, and in a parallel study we combined this with chemotherapy and noticed it induced tumour regression," he explained.

Workenhe conducted his research in the lab of Karen Mossman, chair of the Department of Biochemistry and Biomedical Sciences and a member of the Michael G. DeGroote Institute for Infectious Disease Research

and the McMaster Immunology Research Centre.

The researchers study oncolytic viruses, which are novel cancer therapeutics that kill cancer cells but spare normal, healthy cells, thus mediating their cancer-killing activity without the adverse side effects common with radiation therapy and chemotherapy.

"In addition to directly killing tumor [cells](#), oncolytic viruses activate the host immune response, leading to both clearance of the virus and recognition and clearance of the tumour," said Mossman.

Workenhe and Mossman's work supports recent studies that have found that some kinds of [cell death](#) are more beneficial in a therapeutic context compared to other types of cell deaths. Apoptosis, or programmed cell death, is a "quiet" form of cell death that has evolved not to stimulate an immune response, as it plays an essential role in normal growth and development. Most viruses induce apoptosis following infection.

However, Workenhe found that HSV vectors that induce a different type of cell death, called "immunogenic cell death," are better at stimulating the [immune response](#). Effects on tumour regression and subsequent survival were observed when the virus was used in combination with an approved chemotherapy drug.

The research team, which currently focuses on breast cancer, plans to expand their work to other types of cancer using a variety of combination therapy strategies.

Provided by McMaster University

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