New processes identified for killing cancer cells

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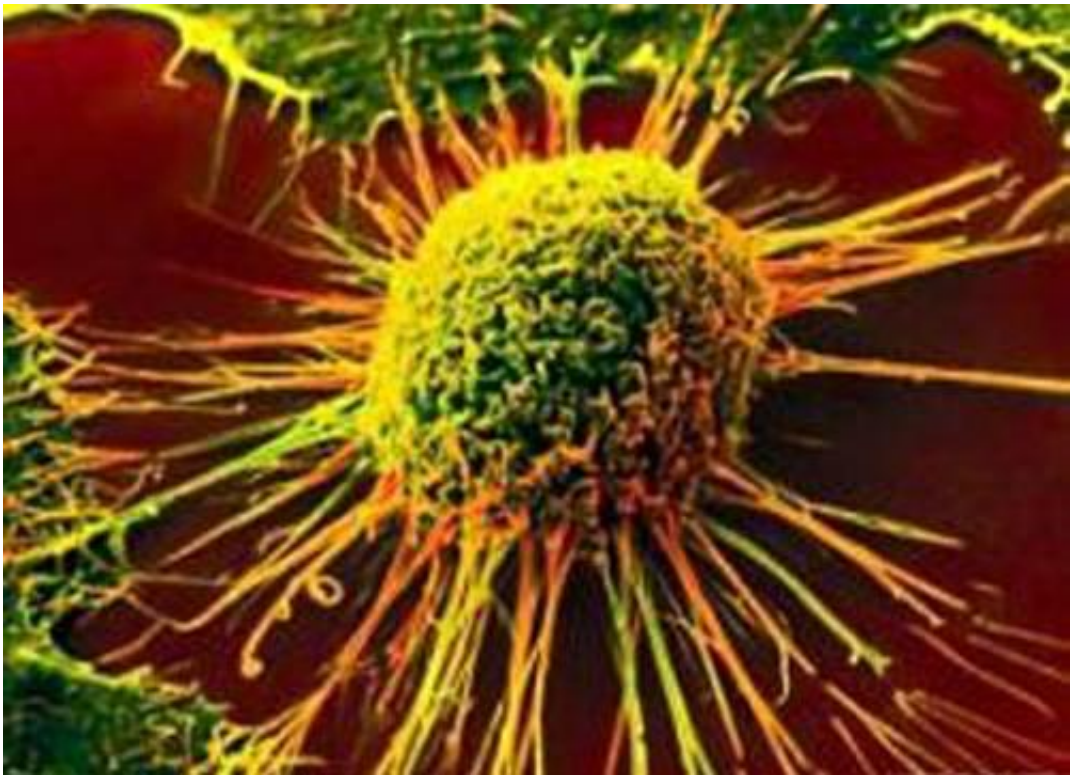

(Medical Xpress)—The cell processes used by a traditional Asian health food supplement to inhibit the growth of prostate cancer cells, have been discovered by a University of Auckland researcher.

The research by Masters student, Ben Kao, involved comparing the

impact of different ethanol and water based extracts of Ganoderma lucidium on cell lines of prostate cancer, and identifying how this compound kills cancer cells and reduces inflammation.

Ganoderma is a genus of the polypore mushrooms which grow on wood and include about 80 species, many from tropical regions. They are often referred to as shelf mushrooms or bracket fungi.

Genes associated with cell proliferation, cell cycle, and apoptosis (the process of cell death), were found by Ben, to have significant changes in their expression levels after treatment with the extracts.

The mushroom, Ganoderma lucidium or Lingzhi as it is known in China (Reishi in Japan), is widely available in Asian countries and has been used for millennia in Chinese medicine to promote good health.

They are available in Asia in a variety of forms and strengths, from low-strength pills to high quality red mushroom extract. The strength of the Ganoderma product can depend on how it is extracted and treated. Claims often made about Ganoderma lucidium are that the product will boost the immune system, improve circulation, reduce cholesterol, lower blood pressure, destroy tumours, and slow aging.

Research student, Ben Kao has had two scientific papers published recently on Ganoderma lucidium and its anti-cancer properties. The first published last year, was a literature review on the anti-cancer properties of Ganoderma lucidium – its active ingredients and pathways of activity.

This month, he has published a study comparing the gene expression profiles and pathway networks after treating prostate cancer cell lines with the different Ganoderma lucidium extracts.

"Ganoderma lucidium has been seen to have a growth inhibitory effect

on prostate cancer, but most of the research has tested only one type of extract," says Ben. "For this study we compared four different extraction methods to see which is the most powerful and to see how it exerts its effects."

Two extracts were made using ethanol based extraction and two used water based extraction methods.

"The ethanol based extracts had the more direct effect on cancer cell growth by inhibiting the cell cycle and were more powerful than water based extracts," says Ben. "For the water based extracts, the mechanism of action involved the immune and anti-inflammatory pathways within the cell."

The Ganoderma lucidium was shown to have a strong effect on limiting cell growth in the cancer cell lines and has no negative effect on normal cell lines.

This study was completed for Ben's Master's thesis in the Discipline of Nutrition and the Auckland Cancer Society Research Centre at the University of Auckland, and supervised by ACSRC research fellow, Dr Karen Bishop. He has submitted a preliminary PhD proposal to continue with research on Ganoderma lucidium and this will focus on the impact of extracts in more advanced biological models.

Provided by University of Auckland

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