

Study: Fungus compounds may slow prostate cancer

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Compounds found in a common fungus have the potential to slow the progression of prostate cancer, the tumor recently diagnosed in Prime Minister Ehud Olmert and in around 2,250 other Israeli men every year.

The discovery was made recently by researchers at the University of Haifa and announced on Wednesday.

The compounds identified in *Ganoderma lucidum* were found help suppress some of the mechanisms involved in the progression of prostate cancer. They disrupt the activity of androgen receptors and impede the proliferation of cancerous cells.

Over the past 40 years, much research has examined the medicinal properties of different fungi, which - except for mushrooms - are largely invisible to the naked eye. They live in soil and dead matter, and in asymbiotic relationship with plants, animals or other fungi. They decompose matter and are indispensable in nutrient cycling and exchange. Many fungi contain bioactive compounds such as alkaloids and polyketides that are toxic to animals and humans.

The compounds in *Ganoderma lucidum* were found to have the ability to fight cancer in a number of ways, but most of the work concentrated on how fungi affect the immune system. In this research - conducted by Dr. Ben-Zion Zaidman under the direction of Prof. Eviatar Nevo and Prof. Solomon Wasser from the university's institute of evolution and Dr. Jamal Mahajna from the Migal Galilee Technology Center - the researchers examined how fungi fight cancer from within cells.

"Up to now, research has been based on enhancing the immune system with high-molecular-weight polysaccharides that act through specific receptors in cell membranes. We concentrated our research on low-molecular-weight secondary metabolites that can penetrate the cells and act at the molecular level from within the cell itself," Zaidman said.

According to the researcher, prostate cancer - one of the most common cancers among men in the West - is controlled by the androgen receptor, especially in the initial stages of development of the disease. Therefore, all medications currently used to treat prostate cancer work to reduce the production of androgens or to interfere with their function via the androgen receptor.

In the first stage of the research, 201 organic extracts from 68 types of fungi were produced with solvents such as ether, ethyl acetate and ethanol. These solvents are used to select molecules that are small enough to act from within human cells. Of the 201 extracts, 11 were found to deter androgen receptor activity by more than 40 percent. Later, 169 extracts were tested for cancer cell growth inhibition. In this study, 14 extracts were found to be active in inhibiting prostate cancer cells.

The active extracts from *Ganoderma lucidum* were the most effective in inhibiting the function of the androgen receptor and controlling vital development of cancerous cells.

"The results of this research are particularly interesting from a commercial aspect. Potential possibilities exist to establish research and development of bioactive metabolites from *Ganoderma lucidum* that could yield an

anti-prostate cancer drug," Zaidman said.

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