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Natural Compound Found in Herbs, Vegetables Could Reduce Breast Cancer Risk in Some Women

Luteolin may inhibit growth of human breast cancer cells in postmenopausal women taking hormone replacement therapy

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COLUMBIA, Mo. – More than 100 women die from breast cancer every day in the United States. The odds increase in postmenopausal women who have taken a combined estrogen and progestin hormone replacement therapy; these women also have an increased risk of developing progestin-accelerated breast tumors. Now, **University of Missouri** researchers have found that luteolin, a natural compound found in herbs such as thyme and parsley as well as vegetables such as celery and broccoli, could reduce the cancer risk for women who have taken hormone replacement therapy.

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Salman Hyder found that luteolin, a natural compound found in thyme and celery could reduce the cancer risk for women who have taken hormone replacement therapy.

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"In most circumstances, hormone replacement therapies improve the lives of menopausal women and achieve excellent results," said Salman Hyder, the Zalk Endowed Professor in Tumor Angiogenesis and professor of biomedical sciences in the College of Veterinary Medicine and the Dalton Cardiovascular Research Center. "Nevertheless, research has proven that a higher incidence of breast cancer tumors can occur in women receiving therapies that involve a combination of the natural component estrogen and the synthetic progestin.

"Most older women normally have benign lesions in breast tissue," Hyder said. "These lesions typically don't form tumors until they receive the 'trigger'— in this case, progestin—that attracts blood vessels to cells essentially feeding the lesions causing them to expand." His newest study shows that when the supplement luteolin is administered to human breast cancer cells in the lab, benefits can be observed including the reduction of those vessels "feeding" the cancer cells causing cancer cell death.

Hyder's lab has found that as human breast cancer cells develop, they tend to take on stem cell-like properties, which can make them harder to kill. Here, luteolin was used to monitor stem cell-like characteristics of breast cancer cells and his team saw a vast reduction in this phenomenon, further proving that the natural compound exerts its anti-tumor effects in a variety of ways.

Then, Hyder further tested laboratory mice with breast cancer and found that blood vessel formation and stem cell-like characteristics also were reduced *in vivo*, or inside the body.

"We feel that luteolin can be effective when ***injected directly into the bloodstream***, so IV supplements may still be a possibility," Hyder said. "But, until the supplement is tested for safety and commercialized, which we hope will happen after further testing and clinical trials, women should continue consuming a healthy diet with fresh fruits and vegetables."

The early-stage results of this research are promising. If additional studies are successful within the next few years, MU officials will request authority from the federal government to begin human drug development (this is commonly referred to as the “investigative new drug” status). After this status has been granted, researchers may conduct human clinical trials with the hope of developing new treatments for breast cancer in women who have taken combined estrogen and progestin hormone replacement therapies.

Researchers involved with the study included Matthew T. Cook, a recent doctoral graduate and research scientist at Dalton Cardiovascular Research Center; Cynthia Besch-Williford, associate professor of veterinary pathobiology; Yayun Liang, a research associate professor of biomedical sciences in the College of Veterinary Medicine at MU; and Sandy Goyette and Benford Mafuvadze, who are graduate students in biomedical sciences.

The research recently was published in the journal *Springer Plus* through the generosity of numerous donors to the Ellis Fischel Cancer Center at MU.

***Editor’s Note*:** For more information about related MU research:

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