

Probiotic bacteria may enhance tamoxifen effectiveness in treatment of ER+ breast cancer

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Probiotic bacteria may enhance anti-cancer activities of the breast cancer drug tamoxifen and other endocrine-targeted therapies, which

could help reduce the risk of estrogen receptive positive (ER+) breast cancer, suggests a new study presented Monday at ENDO 2022, the Endocrine Society's annual meeting in Atlanta, Ga.

While the majority of bacteria in the body is in the [intestinal tract](#), bacteria have been identified in other areas of the body, including the breast. Bacteria is one part of the breast's microbiome—the collection of all microbes such as bacteria, fungi, viruses and their genes. Studies have shown that [breast tissue](#) has a distinct microbiome, which changes in the presence of tumors or diet, according to lead researcher Katherine L. Cook, Ph.D., of Wake Forest University School of Medicine in Winston-Salem, N.C.

Tamoxifen is a drug given to women to prevent a recurrence of ER+ breast cancer. A breast cancer is ER+ if it has receptors for estrogen. This suggests that the [cancer cells](#), like normal breast cells, may receive signals from estrogen that tell the cells to grow. Tamoxifen also is given to reduce the risk of breast cancer in women with a higher-than-average risk of the disease who haven't been diagnosed. Tamoxifen is one of a class of drugs called endocrine-targeted therapies. Other such drugs include aromatase inhibitors and Faslodex.

The new study had three parts. First, a preclinical mouse model was fed a [healthy diet](#) or a Western diet and was treated with tamoxifen for three months. They then evaluated bacteria in breast tissue. They found elevated levels of *Lactobacillus* in the animals given tamoxifen. *Lactobacillus* is a type of bacteria known as gram-positive. It is most commonly known for its probiotic, anti-inflammatory activities.

The researchers then injected *Lactobacillus* into the mammary glands of mice that spontaneously develop breast tumors and found *Lactobacillus* treated animals displayed decreased breast tumor formation. "This shows that increased *Lactobacillus* in breast tissue decreases breast cancer risk,"

Cook said. "It suggests a potential role for *Lactobacillus* and other [bacterial species](#) to enhance patients' response to treatment and to reduce breast cancer risk."

In the second part of the study, researchers looked at a large animal model in which ovaries were removed to simulate menopause and subjects were treated with tamoxifen for 2.5 years. The researchers found they, too, had high levels of *Lactobacillus* in breast tissue.

In the third part of the study, the researchers looked at tissue from ER+ breast tumors from women who had been treated in the neoadjuvant setting with one or two endocrine-targeted therapies, [aromatase inhibitors](#) or Faslodex. After their breast cancer surgery, the tumors were analyzed. Women with high levels of Gram-positive bacteria within their tumors had lower levels of cancer cell growth.

"Taken together, our new research suggests that [probiotic bacteria](#) may enhance anti-cancer activities of tamoxifen and other endocrine-targeted therapies to reduce ER+ [breast cancer](#) risk," Cook said.

Provided by The Endocrine Society

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