Osteoporosis Drug Bazedoxifene Stops Growth Of Breast Cancer Cells

Breast Cancer

Editors' Choice

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Bazedoxifene, an osteoporosis medication which is approved in Europe, stops the growth of breast cancer cells, including those that are resistant to current medications, researchers from the Duke Cancer Institute reported at *ENDO 2013 - The Endocrine Society's Annual Meeting* in San Francisco, California, June 15th, 2013.

The team explained that bazedoxifene not only blocks estrogen so that it cannot fuel breast cancer cell growth, but it also makes sure the estrogen receptor is killed off - it flags the estrogen receptor for destruction.

The study was conducted by Suzanne Wardell, Donald McDonnell, Erik Nelson and Christina Chao, they all work at Duke University School of Medicine.

Bazedoxifene undermines estrogen receptor and gets rid of it too

Donald McDonnell, PhD, chair of Duke's Department of Pharmacology and Cancer Biology, said:

> "We found bazedoxifene binds to the estrogen receptor and interferes with its activity, but the surprising thing we then found was that it also degrades the receptor; it gets rid of it."

In cell cultures and animal studies, the researchers discovered that bazedoxifene:

- halts the growth in estrogen-dependent cells
- inhibits the growth of cells that have become resistant to tamoxifen and/or to the aromatase inhibitors, two of the most commonly used types of medications to prevent and treat estrogen-dependent breast

cancer.

Current therapy for patients whose breast cancer cells have become resistant is to administer highly toxic chemotherapy agents which have considerable side effects.

Bazedoxifene, an orally-administered pill, belongs to a class of medications known as SERMS (specific estrogen receptor modulators). These medications can mimic estrogen in some tissues, while at the same time blocking estrogen's action in other tissues. Tamoxifen is also an SERM. However, bazedoxifene also has some of the properties of SERDs (selective estrogen receptor degraders). **SERDs can flag the estrogen receptor for destruction. Tamoxifen cannot do that**.

Lead author Suzanne Wardell, PhD, said:

> "Because the drug is removing the estrogen receptor as a target by degradation, it is less likely the cancer cell can develop a resistance mechanism because you are removing the target."

McDonnell explained that most scientists had assumed that as soon as breast cancer cells became resistant to tamoxifen, they would also be resistant to SERDs.

McDonnell said "We discovered that the estrogen receptor is still a good target, even after it resistance to tamoxifen has developed."

Bazedoxifene also inhibited the growth of lapatinib-resistance cancer cells

The scientists tested a range of breast cancer cell types, including those that are sensitive to tamoxifen but resistant to lapatinib, a medication used for patients with advanced breast cancer whose tumors contain the mutated HER2 gene. Previous studies had shown that these cells reactivate estrogen signaling and thus acquired drug resistance. Bazedoxifene also inhibited their growth.

Bazedoxifene behaves like estrogen in bone tissue, thus protecting it from destruction. As bazedoxifene is an existing FDA-approved medication, meaning it has already undergone efficacy and safety trials for osteoporosis, it could be a near-term option for women with advanced breast cancer who have not responded to other treatment options, Wardell wrote.

Bazedoxifene was approved in April 2009 by the European Commission under the trade name Conbriza® for the treatment of postmenopausal osteoporosis in women at increased risk of fracture.

The main side effect associated with bazedoxifene therapy was hot flashes.

Written by Christian Nordqvist

References

ENDO 2013 - The Endocrine Society's Annual Meeting

"Osteoporosis Drug Stops Growth of Breast Cancer Cells, Even in Resistant Tumors"
Duke University Medical Center

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