

New test suggests antidepressant Paxil may promote breast cancer

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A team of researchers from the City of Hope in Duarte, Calif., has developed a speedy way to identify drugs and chemicals that can disrupt the balance of sex hormones in human beings and influence the development and progress of diseases such as breast cancer.

In a trial screening of 446 drugs in wide circulation, the new assay singled out the popular antidepressant paroxetine (better known by its commercial name, Paxil) as having a weak estrogenic effect that could promote the development and growth of [breast tumors](#) in women.

This is important because as many as a quarter of women being treated for [breast cancer](#) suffer from depression - a condition most commonly treated with antidepressants known as SSRIs (selective serotonin reuptake inhibitors), including Paxil, which has been on the market since 1992. Almost a quarter of American women in their 40s and 50s are taking an antidepressant, mostly SSRIs.

Last summer, the Food and Drug Administration approved the marketing of a low dose of paroxetine - repackaged under the commercial name Brisdelle - as a nonhormonal treatment for hot flashes and other menopausal symptoms.

About 70 percent of breast cancers in women are sensitive to estrogen, meaning that the hormone found plentifully in females of child-bearing age contributes to their growth.

The novel screening method developed at City of Hope, described in a forthcoming issue of the journal *Toxicological Sciences*, also identified two antifungal medications - biconazole and oxyconazole - as having an anti-estrogenic effect similar to that of medications prescribed to prevent breast cancer and its recurrences in women. Incidental to their intended use in combating fungal infections, those medications inhibit the action of aromatase, an enzyme that converts androgens - hormones more plentiful in males but present in both sexes - into estrogen.

Less surprising, the high-throughput screening mechanism identified bisphenol A - a compound used in the manufacture of plastics and epoxy resins - as an estrogen promoter capable of raising [breast cancer risk](#).

The discovery that Paxil behaves as an endocrine-disrupting chemical may shed light on growing suspicions about the medication in women who have had breast cancer. A 2010 study found that [breast cancer patients](#) in Canada who were taking Paxil were more likely than those taking other antidepressants to die of breast cancer when there was a substantial overlap in their use of that antidepressant and of tamoxifen to prevent [breast cancer recurrence](#).

The researchers surmised that paroxetine, which was taken by about a quarter of the depressed breast cancer patients in the study, might block the production of a liver enzyme needed to metabolize tamoxifen. The authors of the latest research said paroxetine's "weak estrogenic" effect "may be responsible, in part, for the observed reduction" in tamoxifen's effectiveness in that study.

The finding that paroxetine has estrogenic effects "has implications for patients with estrogen-sensitive breast cancer who are on other medications," said Shihuan Chen, professor and chairman of City of Hope's department of cancer biology and lead author of the study.

To confirm paroxetine's estrogenic action, the researchers performed a further analysis that found that many of the genes whose activity is altered by paroxetine are genes that also respond to estrogen. But the researchers said the assay does not show whether the antidepressant medication alters the activity of estrogen directly or by indirect means.

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