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# Iodine stimulates estrogen receptor signaling and its systemic level is increased in surgical patients due to topical absorption.

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## Abstract

Iodine is crucial for thyroid hormone production. However, recent epidemiologic studies have shown that breast cancer patients have an elevated risk of developing thyroid cancer and vice versa. A notable finding in this study is that iodine stimulated the transcriptional activity of estrogen receptor- $\alpha$  (ER- $\alpha$ ) in breast cancer cells. Iodine stimulated expression of several ER- $\alpha$  regulated gene including *PS2*, *Cathepsin D*, *CyclinD1*, and *PR* both *in vitro* and in nude mice, which is consistent with its stimulation of both anchorage-dependent and -independent growth of ER- $\alpha$  positive breast cancer cells and the effect to dampen tumor shrinkage of MCF-7 xenograft in ovariectomized nude mice. Analyses of clinical urine samples from breast cancer patients undergoing surgery demonstrated that urinary iodine levels were significantly higher than that in controls; and this increased level is due to the antiseptic use of iodine during breast surgery. The present study indicates that excess iodine intake may be an unfavorable factor in breast cancer by stimulation of ER- $\alpha$  transcriptional activity.

KEYWORDS: ER- $\alpha$ ; breast cancer; iodinePMID: 29416620 PMCID: [PMC5787473](#) DOI: [10.18632/oncotarget.20633](#)

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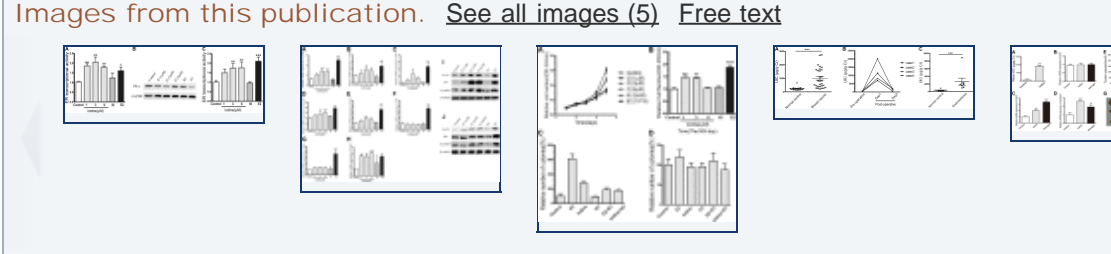
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