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Resveratrol is a superinducer of the estrogen receptor

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Estrogens are steroid hormones that diffuse across the cell membrane and into the nucleus to bind with the estrogen receptor (ER). When bound, usually by the body's natural estrogen, estradiol, the ER binds with a specific DNA sequence found in the promoter region of estrogen target genes and is effectively able to regulate gene expression. Interestingly, many synthetic chemicals have been found to exhibit estrogen-like qualities because they are also able to interact with the estrogen receptor; these estrogen-mimicking compounds have been termed xenoestrogens. Billions of pounds of said chemicals are produced annually and can be found in many of today's widely used plastics, cosmetics and pesticides. Since xenoestrogens are capable of eliciting such significant biological alterations, like gene expression regulation, and are ubiquitous in nature, they pose an increasingly serious threat to public health. In this study, one known xenoestrogen, resveratrol, found in the skins of grapes and grape-related products, was tested for estrogenic activity. Immortalized MCF7 breast cells were transfected with an estrogen-sensitive reporter gene and then induced with a range of resveratrol concentration. After a twenty-five hour induction, the cells were screened for estrogenic response. It was found that resveratrol displays an atypically steep dose response and can be classified as a superinducer of the ER. Further investigation must still be done to determine what in vivo biological implications a xenoestrogen of this kind carries and will be performed using a transgenic estrogen-responsive mouse model.

