

The effects of triclosan on mammalian ovary cell growth and gene expression

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Triclosan is a synthetic antibiotic used in multiple personal care products for its broad spectrum defense against microbial growth. The effects of triclosan outside of the microbial realm are largely unknown, but research is beginning to show that there is a significant effect on some mammals, even at low concentrations. This experiment uses Chinese hamster ovary (CHO) cells to test the effects of triclosan at various concentrations between 1ppm and 7ppm to investigate previous reports of increased cell proliferation at low triclosan concentrations and inhibition of cell proliferation at high triclosan concentrations. Control tests were also performed, treating CHO cells with only the acetone solvent, however results suggest that acetone does not significantly affect cell proliferation. The LC_{50} for CHO cells treated with triclosan was calculated to be 6.5ppm. Results from the triclosan tests show that triclosan causes cell proliferation to increase by 79% ($p < 0.005$) in 3ppm treatment conditions and decrease by 74% ($p < 0.005$) in 7ppm treatment conditions when compared to control cell growth. RNA from cell cultures treated with 0ppm, 2ppm, and 6.5ppm of triclosan was subjected to RT-qPCR using primers for CHO GstE9, a gene implicated in toxin defense. Expression of GstE9 in the 6.5ppm test decreased 3.69 fold ($p < 0.01$) compared to the control. While it is surprising that a gene implicated in toxin defense is downregulated in response to triclosan exposure, similar findings have been reported on the expression of another member of the Gst family of enzymes in response to triclosan treatment, though no clear explanation has been provided.