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Author(s)	Yip, KY; Wong, AST; El-Nezamy, H
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GROWTH AND ENDOCRINE DISRUPTING EFFECTS OF THE MYCOTOXINS ZEARALENONE AND AFLATOXIN B1 ON BREAST CANCER CELLS

Yip KY, Wong AST and El-Nezami H

School of Biological Sciences, The University of Hong Kong, Hong Kong SAR

soda@hku.hk

Zearalenone (ZEA) and aflatoxin B1 (AFB1) are secondary metabolites produced by the fungi *Fusarium* and *Aspergillus* respectively. ZEA is proven to be an estrogenic endocrine disruptor since 1950s, while AFB1 is recently found to disrupt steroidogenesis in placenta. Both mycotoxins are constant contaminants of cereals worldwide and can both be found at significant levels in human plasma/urine of people in developing countries. Due to the co-occurrence of ZEA and AFB1 in food and human samples and the possibility of endocrine disruptors to modulate the growth of hormonal dependent breast cancer, we hypothesized that exposure to ZEA and AFB1 would affect the growth and cell cycle progression of breast cancer cells by modulating gene expressions and disrupting steroidogenesis and hormone metabolism.

In the present study, the effects on growth and cell cycle progression of breast cancer cells MCF-7 after exposure to individual and combination of ZEA and AFB1 were evaluated. It was found that ZEA could significantly increase proliferation of MCF-7 with a dose dependent manner while AFB1 had an antagonistic effect. To investigate whether steroidogenesis and hormone metabolism are affected by exposure to mycotoxins, real time PCR array was performed. Expression of genes was modulated and interactions were found between exposure to ZEA and AFB1.

In summary, ZEA and AFB1 could modulate the growth and proliferation of breast cancer cell MCF-7, and exposure to these mycotoxins also affect the gene expression related to steroidogenesis and hormone metabolism in MCF-7. AFB1 always has an opposing effect to ZEA.