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In vitro toxicity of beauvericin alone and combined with fumonisin B1 or deoxynivalenol on Caco-2 cells.

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Abstract

Beauvericin (BEA) is a mycotoxin produced by *Fusarium* species, frequently occurring in cereal grains in combination with fumonisin B1 (FB1) and deoxynivalenol (DON). The aim of this study was to evaluate the in vitro toxic effects of BEA alone and combined with FB1 or DON on human intestinal Caco-2 cells cultured on semi-permeable inserts (Caloni et al., 2012). Caco-2 cells were treated for 24 h with BEA (1.5 μ M) alone and combined with FB1 (1.5 μ M) or DON (3.5 μ M) on both apical (Ap) and basolateral (Bl) sides. Barrier impairment was assessed by measuring the trans-epithelial electrical resistance (TEER) after 1 h, 2 h and 24 h of treatment. At the end of the experiment, the culture medium was collected for interleukin-8 (IL-8) determination. The results indicate that TEER was not significantly affected by Ap or Bl exposure to BEA and FB1 alone, whereas a significant decrease ($P < 0.05$) of TEER was observed after exposure to BEA in combination with FB1 for 1 h and 2 h. DON was found to decrease ($P < 0.05$) TEER alone and combined with BEA after Bl application starting from the second hour of treatment. No significant release of the inflammatory mediator IL-8 was observed after Ap or Bl exposure to BEA and FB1 alone and in combination. On the contrary, DON alone and combined with BEA induced a significant ($P < 0.05$) release of IL-8 after both Ap and Bl exposure. Further investigations are underway to better clarify the effects of BEA on the intestinal epithelium and its interaction with other fusariotoxins.

References

Caloni, F., Cortinovis, C., Pizzo, F., De Angelis, I., 2012. Transport of Aflatoxin M1 in Human Intestinal Caco-2/TC7 Cells. *Front. Pharmacol.* 3, 111.