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Alternariol mycotoxin induce oxidative stress in porcine epithelial cell line IPEC-1

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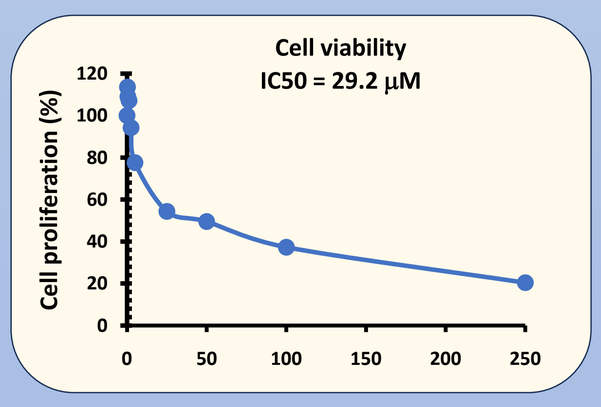
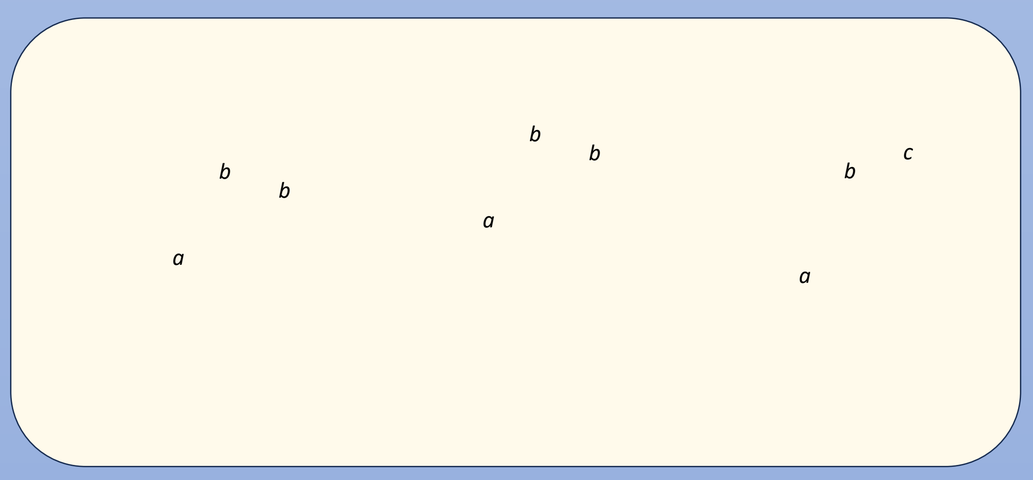
Alternaria toxins are secondary metabolites with different chemical structure, produced by fungus belonging to *Alternaria* species (Ostry, 2008). Exposure to *Alternaria* mycotoxins was associated with different negative effects on human and animal health, including cytotoxic, mutagenic, genotoxic and carcinogenic effects (EFSA, 2016). Pigs through the consumption of a diet rich in cereals are particularly exposed to the mycotoxin contamination (Marin et al., 2020). After oral ingestion, mycotoxins present in food or feed reach the body and interact in the first place with the cells of the gastrointestinal tract.

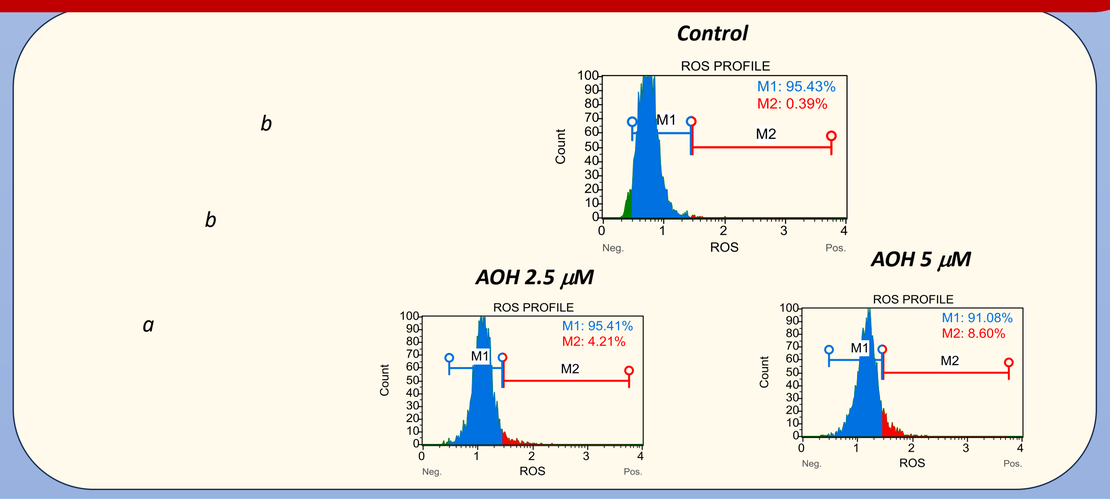
For this reason, the aim of our study was to investigate the capacity of alternariol (AOH), a very common contaminant produced by Alternaria fungi, on porcine epithelial intestinal cells.

IPEC-1 cells were cultivated in cell plates for 24h and exposed to different AOH concentrations for another 24h. Different markers associated with oxidative stress (activity of enzymes involved in antioxidant defense: catalase, superoxide dismutase, glutathione peroxidase) and oxidation of lipids, DNA and proteins were investigated.



Our results indicated a dose related effect on cell viability with a calculated IC50 of 29.2µM. AOH significantly decrease the activity of antioxidant enzymes superoxide dismutase (a decrease of 9.2% for AOH 2.5µM and 38.9% for AOH 5µM) and catalase (a decrease of 44.5% for AOH2.5µM and 52% for AOH 5µM) as compared with the control.





Exposure to AOH induces a significant increase of ROS (+) cells by 6.5 and 9.23 times for the concentrations of 2.5µM and 5µM AOH as measured using a flow cytometry test. These effects were accompanied by a significant increase of protein, lipid and DNA oxidation.

CONCLUSION. Our results have shown that the exposure of porcine epithelial intestinal cells IPEC-1 to AOH significantly decrease the cell proliferation, inducing an increase of the oxidative stress and a decrease of antioxidant defense in porcine epithelial intestinal cells.

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