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Deoxynivalenol induces apoptosis in cell cultures and the antibiotic fosfomycin protects cells from nuclear changes

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Deoxynivalenol (DON) is a mycotoxin which inhibits protein synthesis and causes cytotoxicity. Fosfomycin (FOS) is a bactericidal broad-spectrum antibiotic used in human and veterinary medicine with some extra antimicrobial properties. We have demonstrated that after 4 hours of incubation, FOS was able to prevent the cytopathic effect of DON on Hep2 cells. To corroborate these results and to determine whether the effect of DON was due to the induction of apoptosis, Hep2 cells were seeded in 6 well-plates and after 24 hours, cell monolayers were treated with DON (2.8 µg/mL) alone or with DON (2.8 µg/mL) and FOS (550 µg/mL). The presence of nuclear morphological changes representative of apoptosis was evaluated by DAPI staining under immunofluorescence microscope, the percentage of apoptotic cells was determined and the results were evaluated by ANOVA/Tukey test. Cell cultures incubated with DON and FOS were similar to control wells showing the absence of cytotoxicity. Apoptotic cells percentage was significantly higher (5.64±0.27) ($p<0.01$) for cells treated with DON than for cells incubated with both the mycotoxin and the antibiotic (0.65±0.5). To determine whether DON was able to induce apoptosis in different cells lines and at lower concentrations, MDBK and BHK cells were also treated with DON at 1 µg/mL for 24 hours. Results show that the mycotoxin induces apoptosis in all the assayed cell lines. Further studies are needed to confirm that the protective effect of the antibiotic occurs in all cell lines and its implications under in vivo conditions.

Biography

Denisa S Perez is a Veterinarian and she has completed her PhD from the National University of Buenos Aires Province (Argentina). She is performing Postdoctoral Studies at the Toxicology Area in the Physiopathology Department of Tandil Veterinary Research Center. She is also a Professor at Veterinary Sciences Faculty. She has published an important amount of research articles in reputed journals.

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