

4th World Congress on

Cell Science & Stem Cell Research

June 24-26, 2014 Valencia Conference Centre, Valencia, Spain

Analysis of HepG2 cells exposed to emergent *Fusarium* mycotoxins

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Mycotoxins are secondary toxic metabolites produced only by fungi and under appropriate environmental conditions. Their toxicity has been related with inhibition of protein synthesis, mitochondrial dysfunction, formation of DNA adducts, disruption of calcium homeostasis and ROS generation. Enniatins (ENs) are emergent *Fusarium* mycotoxins, produced by *Fusarium* fungi. Besides their antibiotic activity, ENNs inhibit the acyl-CoA: cholesterol acyltransferase. However, several lines of investigation suggest that ENNs may be genotoxic *in vivo* as *in vitro* because of their DNA damage and induction of DNA-adduct formation. Disruption of mitochondrial membrane potential (MMP) in the cell cycle and increase of apoptotic in Hep G2 cells of four emergent *Fusarium* mycotoxins, enniatin A (EN A), enniatin A1 (EN A1), enniatin B (EN B) and enniatin B1 (EN B1) at concentrations of 1.5 and 3 μ M for 24, 48 and 72 h by using flow cytometry were studied. The data comprise the measurements of a dual staining: for MMP using TMRM and, for plasma membrane permeability by ToPro-3; and a single staining for DNA analysis and cell cycle phase distribution by PI. It was demonstrated for the first time that a depolarization of the mitochondrial membrane in HepG2 cells by the emergent mycotoxins treatment triggers the mitochondrial pathway leading to cell death. An altered mitochondrial response in HepG2 cells was observed after 24 h incubation. A different decline of MMP was accompanied by decreasing cell viability. Arrest of cell cycle phases were affected by time exposure and concentration of mycotoxins studied. All the parameters studied varied depending on the ENs tested. Cells arrested in G2/M phase prevents cells from entering or completing division or cells may enter slowly, arrest of S phase slows the cell cycle possibly related with effects occurring during G2/M phase.

Biography

Ana Juan-García PhD completed her European PhD in Food Science at University of Valencia with two stays in Cork Institute of Technology (CIT) in Ireland and in Università degli Studi di Cagliari in Italy. Then, she continued her 2-year Postdoctoral research at Purdue University in USA learning and working with flow cytometry. Nowadays, she is Associate Professor of Toxicology at University of Valencia and she is involved in the research carried out by COAL-UV's research group studying the role of mycotoxin compounds in causing toxicological effects in several cell lines.

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