

4th International Food Safety, Quality & Policy Conference

December 05-06, 2016 Dubai, UAE

Molecular effects on individual and combined toxicity of OTA and CTN against human embryonic kidney 293 cells

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Ochratoxin A (OTA) and citrinin (CTN) are very important mycotoxins and often found in the same food and feed stuff. OTA exposure may lead to genotoxicity and carcinogenicity, while CTN is noticed by its nephrotoxicity. In the present study, individual and combined cytotoxicity of OTA and CTN against HEK293 cells were determined by the MTT assay, which showed a toxicologic synergism caused by the interaction of OTA and CTN. In addition, the results revealed that CTN led to the HEK293 cells accumulated in G2/M stage, and the combined treatment of CTN and OTA led to a dramatic increase in S and G2/M stages, but OTA treatment alone could not induce the cell cycle arrest. Furthermore, the HEK293 cells suffered by individual and combined treatment of OTA and CTN were performed transcriptome and MicroRNA sequencing with illumina Hiseq2500 platform, which indicated 133 miRNAs and 266 target genes were significantly involved. The expressions of certain miRNAs and target genes were also validated by quantitative real-time PCR. The correlations between miRNAs and their target genes associated with apoptotic signaling were furthermore analyzed by pmi-RB-REPORT™ luciferase assay system. This study provided intensive molecular evidences on toxicological basis of OTA and CTN poisoning to human HEK293 cells.

Biography

Feng Chen obtained his BS from Shanghai Oceanic University in 1990, and MS from Jiangnan University in 1992. He was awarded the PhD degree from Louisiana State University, Baton Rouge, LA, USA, 1998. After finishing his Post-doctoral research in LSU, he became a tenure-track Assistant Professor in the Department of Food Science and Human Nutrition of Clemson University in 2001, and promoted to Associate Professor in 2007 and full Professor in 2011. He has served as a university Faculty Senator between 2011 and 2013 and college Faculty Senator Leader in 2013-2014, as well as the President of Jiangnan University Alumni Association in North America (JUANA) between 2013-2015. His research interests focus on Food Chemistry, particularly Functional Food and Food Flavors. He has published 150 SCI papers and 9 book chapters, edited 2 books. In addition, he has been awarded and licensed 5 US patents and 2 international patents. During the last 10 years, he has hosted 31 international visiting scientists and 10 international student exchanges. So far, he has advised 14 PhD and 13 MS students. He has also been serving as a review panel member for the Chinese National Natural Scientific Foundation (CNSF).

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