

7th Euro-Global Summit on

Toxicology & Applied Pharmacology

October 24-26, 2016 Rome, Italy

***Yiqun Deng***

South China Agricultural University, China

Mitochondrial biogenesis protects animal cells from T-2 toxin

T-2 toxin is one of the most toxic mycotoxins, which has broad toxic effects, like apoptosis, cell cycle arrestment and protein synthesis inhibition. However, the protective responses of the cells to T-2 toxin remain unclear. In our study, it was shown that T-2 toxin strongly induced the ROS accumulation, DNA damage and apoptosis in chicken primary hepatocytes. To further clarify the molecular mechanisms of the toxic and anti-toxic actions, the proteomic changes of chicken primary hepatocytes upon T-2 toxin treatment were investigated, and it was shown that the most abundant proteins regulated by T-2 toxin were associated with cell redox homeostasis, which explained its property of ROS accumulation. Surprisingly, 34% of the T-2 toxin regulated proteins were located in the mitochondrion, and particularly, most of them were up-regulated, which suggest that T-2 toxin potentially impacts on mitochondrial biogenesis. We confirmed experimentally that T-2 toxin enhanced the mitochondrial biogenesis and which generally occurred in different cells including HeLa, HepG2 and HEK 293-T, besides chicken primary hepatocytes. Subsequently, it is found that one of the key regulator of mitochondrial biogenesis, SIRT1, was upregulated under T-2 toxins treatment, and the enhancement of mitochondrial biogenesis and cell viability under T-2 toxin treatment were impaired by knocking-down SIRT1, and strengthened in SIRT1-overexpression cells. Interestingly, the promoter region of SIRT1 is not responsible for the up-regulation by T-2 toxin and further investigation is under way. In summary, our study suggested that the mitochondrial biogenesis enhancement via SIRT1 plays an important role in the protective response to T-2 toxin. This might provide a new direction in T-2 toxin defense.

Biography

Yiqun Deng completed his Doctorate degree in Biochemistry and Molecular Biology at Zhongshan School of Medicine, Sun Yat-Sen University in 2002. After five years' Post-doctoral research at Weill Medical College, Cornell University, he is currently working as Professor, Dean of the College of Life Sciences, South China Agricultural University and Director of Guangdong Provincial Key Laboratory of protein function and regulation in agricultural organisms. He has authored 40 publications in peer-reviewed journals. He is an active member in five scientific societies and serves as an Editorial Board Member of several scientific journals.

yqdeng@scau.edu.cn**Notes:**