

Clinical Trials and Therapeutic Drug Monitoring

August 22-24, 2016 Philadelphia, USA

Apoptotic and necrotic basal forebrain cholinergic neuronal loss after acute and long-term chlorpyrifos exposure

Javier del Pino¹, Paula Moyano¹, María Teresa Frejo¹, María Jesús Díaz¹, Gloria Gomez¹, María José Anadón¹, Margarita Lobo¹, Jimena García², Miguel Andrés Capó¹ and José Manuel García¹¹Complutense University of Madrid, Spain²Alfonso X University, Spain

Chlorpyrifos (CPF) is an organophosphate insecticide reported to induce both after acute and repeated exposure learning and memory dysfunctions, although the mechanism is not completely known. CPF produces basal forebrain cholinergic neuronal loss, involved on learning and memory regulation, which could be the cause of such cognitive disorders. This effect was reported to be mediated through apoptotic process, although neuronal necrosis was also described after CPF exposure. Accordingly, we hypothesized that CPF induces basal forebrain cholinergic necrotic and apoptotic cell death. We evaluated in septal SN56 basal forebrain cholinergic neurons, the CPF effect after 24 h and 14 days exposure on the necrosis induction and the apoptotic and necrotic gene expression pathways. This study shows that CPF induces after acute and long-term exposure necrotic cell death at higher concentrations than which induces apoptotic cell death. Evaluation of cell death pathways revealed that some of them are altered at lower concentrations than which produces the effects observed and below the no observed adverse effect level (NOAEL). The present finding suggests that the use of gene expression profile could be a more sensitive and accurate way to determine the NOAEL.

Biography

Javier del Pino has received his PharmD degree from the University Complutense University of Madrid in the year 2004. He has done two Master's in Sciences in the year 2009 and 2010. He did his Specialization in Neurotoxicology and Neurodevelopmental Toxicology and received his PhD in Toxicology in the year 2009. In 2010, he worked at Institute of Health Carlos III in the National Center of Environmental Health. From 2010 to 2012, he was an Associated Researcher at University of Massachusetts (UMASS), working at Sandra Petersen's Lab in a National Institute of Health (NIH) project on developmental effects of TCDD endocrine disruptor on sexual differentiation. In 2016, he became an Associate Professor of Toxicology at the Complutense University of Madrid, Spain

jdelpino@pdi.ucm.es

Notes: