

## MEETING ABSTRACTS

# DIOXIN SUPPRESSES AChE EXPRESSION IN NEURON AND MUSCLE

Heidi Qunhui Xie <sup>1,2</sup>, Yingjie Xia <sup>1,2</sup>, Tuan Xu <sup>1,2</sup>, Yangsheng Chen <sup>1,2</sup>, Yali Luo <sup>1,2</sup>, Rui Sha <sup>1,2</sup>, Yiyun Liu <sup>1,2</sup>, Li Xu <sup>1,2</sup>, Bin Zhao <sup>1,2</sup>

<sup>1</sup> State Key Laboratory of Environmental Chemistry and Ecotoxicology, Research Center of Eco-Environment Sciences, Chinese Academy of Sciences, Beijing 100085 China

<sup>2</sup> University of Chinese Academy of Sciences, Beijing, China

Acetylcholinesterase (AChE, EC3.1.1.7) plays an important role in the cholinergic neurotransmission in central and peripheral nervous systems, which has been widely recognized as a biomarker for monitoring pollution of organophosphate and carbamate pesticides. Recently, a broad spectrum of environmental toxic substances has been found to decrease AChE activity in various species. Dioxin is one of the emerging environmental AChE disruptors, which is a typical persistent organic pollutant with multiple toxic effects on the nervous system. We have reported that dioxin suppresses the expression of neuronal AChE via aryl hydrocarbon receptor (AhR), in which both transcriptional and posttranscriptional regulations could be involved. Moreover, muscular AChE expression was also disturbed by dioxin exposure. During myogenic differentiation of C2C12 cells, the mRNA expression of AChE T subunit and the enzymatic activity of AChE were significantly suppressed by dioxin exposure in parallel with the disturbances on the myotube formation. However, the addition of AhR antagonist was not able to reverse the suppressive effect of dioxin, suggesting a distinct role of AhR during the myogenic differentiation process. These results further support the notion that dioxin is a novel environmental AChE disruptor which acts on the biosynthesis processes via multiple molecular mechanisms.

## Acknowledgement

This work was supported by Natural Science Foundation of China (Nos. 21177150, 21377160, 21525730), and the Strategic Priority Research Program of the Chinese Academy of Sciences (No. XDB14030400).