S02-10.-**Zebrafish models for human acute organophosphorus poisoning**. *Melissa Faria1, Natalia Garcia-Reyero2,3, Francesc Padros4, Patrick J. Babin5, David Sebastian6,7,8, Jérôme Cachot9, Eva Prats10, Eduardo Rial11, Anja Knoll-Gellida5, Guilaine Mathieu5, Tony Arick2, B. Lynn Escalon3, Antonio Zorzano6,7,8, Amadeu M.V.M Soares1, Demetrio Raldúa12.*- (Presenting Author: ***Demetrio Raldúa***)

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Terrorist use of organophosphorus-based nerve agents and toxic industrial chemicals based against civilian population constitute a real threat, as demonstrated by the terrorist attack against Japanese civilians in the 1990s or, more recently, by the attack against civilians in the suburbs of Damascus, Syria, in 2013. Thus, development of more effective countermeasures against acute organophosphorus poisoning is urgently needed. Here we have generated and characterized zebrafish models for mild, moderate and severe acute organophosphorus poisoning by exposure to different concentrations of the prototypic OP compound, chlorpyrifos-oxon. The main feature of the mildest grade was a moderate impairment in the visual and motor function correlated with the AChE inhibition. The clinical features of the larvae exhibiting the moderate grade were paralysis and tetany of the axial muscles. Finally, the severe grade was characterized by paralysis and cell death at the central nervous systems and axial muscles. Our results show that zebrafish models mimic most of the aspects of this toxidrome in humans, including acetylcholinesterase inhibition, NMDA-receptor activation and calcium dysregulation. The suitability of the zebrafish larvae to in vivo medium and high throughput screenings of small molecule libraries makes these models a valuable tool for identifying new drugs to be used in a multifunctional drug therapy against this toxidrome.

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