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Changes in rat urinary heme metabolites predict the magnitude of the neurotoxic effects induced by a mixture of lead, arsenic and manganese**Vanda Maria Falcão Espada Lopes de Andrade**
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Arsenic (As), manganese (Mn) and lead (Pb) are neurotoxic metals/metalloids that occur as mixtures in specific settings, like mines. Efforts have been made to identify biochemical biomarkers (BMs) of neurotoxicity which can aid an early detection, progression or outcome of treatments. The complexity of the nervous system, individual variability and ubiquity of neurotoxic mixtures, is leading to the belief that multiparameter analysis through the integration of various markers may establish robust correlations between BMs and individual's health status. Metals, including As, Mn and Pb, induce specific and different changes in heme metabolites excretion patterns, and its accumulation can cause neurotoxicity. The aim of this work was to generate 2 predictive models: (A) simpler and designed to detect neurotoxicity and (B) to predict the magnitude of these effects, individually. A group of Wistar rats were co-exposed for 8 days to Pb, As and Mn; a control group was used. Motor activity was evaluated and 24 h urine was collected. Urinary delta-aminolevulinic acid (ALA U) and total porphyrins (Porf U) were determined by spectrophotometry and combined by multiple regressions to detect motor activity decrement (model A). The urinary porphyrin profile was determined by HPLC and used to predict the number of ambulations and rearing using the same statistical method (model B). All subjects were correctly classified regarding to motor activity decrease (model A) and average errors of 2 ambulation or rearing counts were obtained with model B. This work suggests that BMs integration methodologies are promising to assess "Real-Life" scenarios of exposure to chemical mixtures.

Biography

Vanda Maria Falcão Espada Lopes de Andrade graduated in Biology in 1992 and obtained a Master's degree in Animal Biodiversity Conservation in 1998, both from Faculdade de Ciências da Universidade de Lisboa. She has completed her PhD in Pharmacy/Toxicology from Faculdade de Farmácia da Universidade de Lisboa, Portugal in 2014. She is Assistant Professor in Escola Superior Agrária de Santarém, Instituto Politécnico de Santarém since 2013, where she coordinates the curricular units of Toxicology since 2014; and since 2015, Pollution and Ecotoxicology. She has published 9 papers in international journals, performed 15 communications (4 oral presentations and 11 poster presentations) and 8 seminars.

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