

Targeted metabolomic profiling of amino acids in human hair samples using gas chromatography-mass spectrometry as an indicator for pesticide exposure

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The human populations are exposed to pesticides due to its extensive use in agriculture, industry, public health and for domestic applications. In spite of this extensive use, knowledge on the health risks associated with these compounds after long term exposure is rather poor. Previous approaches used to measure the environmental concentrations of pesticides and their biotransformed in body fluids and tissues. In recent years metabolomics is proven to be powerful tool to express the genotype-phenotype changes with respect to disease state and environmental effects in various models. But none of the studies were related to the metabolomics of human samples for pesticide exposure. So, for the first time we are proposing the metabolomic approach (targeted) for the biological monitoring of pesticide exposure using hair as a matrix. A cross sectional epidemiological study was conducted to collect the hair samples of pesticide sprayers (n=30) who regularly do spraying at mango orchards of Malihabad, Lucknow and hair samples of control population (n=11) with same physical characteristics, socio-economic status and not occupationally exposed to pesticides. The PLS-DA loading plots suggest that cysteine, glutamic acid/proline are said to be significantly contribute for the discrimination of exposed and control samples. The observed differences between exposed and control groups are statistically significant ($p < 0.01$). This study demonstrates the versatility of metabolomics as a tool to monitor for the pesticide exposure in humans. The proposed study will be extended to pesticide exposed subjects living in different geographic locations in India for thorough validation in a large sample size.

Biography

I, Ratnasekhar Ch completed my Master of Science in Analytical Chemistry from Andhra University in the year 2007. I have worked in Aptuit Laurus Pvt. Ltd, Hyderabad for about one and half year. I also worked at NIPER, Mohali for about one year in the area of carbohydrate chemistry. Currently, I am pursuing my doctoral work at Analytical Chemistry Division of CSIR-IITR, Lucknow. My research interests mainly focus on mass spectrometry based environmental metabolomics of pesticides. I already communicated two papers to reputed international journals.

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