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Phenylalanine hydroxylase: A biomarker of disease susceptibility in Parkinson's disease and Amyotrophic lateral sclerosis

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Abstract

The S-oxidation of S-carboxymethyl-L-cysteine has been reported previously to be a biomarker of disease susceptibility in Parkinson's disease and Amyotrophic lateral sclerosis. In this investigation, the original observations have been confirmed with the incidence of the poor metaboliser phenotype (no urinary recovery of S-oxide metabolites) being found to be 3.9% within healthy control population. However, 38.3% of the Parkinson's disease subjects and 39.0% of the Amyotrophic lateral sclerosis group were phenotyped as poor metabolisers. The consequent odds risk ratio of developing Parkinson's disease was calculated to be 15.5 (95% CI 9.5–25.3) and for Amyotrophic lateral sclerosis was 15.2 (95% CI 8.8–26.5). Thus, the possible role of the enzyme responsible for the S-oxidation biotransformation reaction, phenylalanine hydroxylase, must be further investigated to elucidate the mechanism(s) of toxicity in susceptible individuals displaying these diseases. A dual role potentially explaining of the role of phenylalanine hydroxylase as a biomarker of disease susceptibility is presented together with the observation that metabolomics is a possible way forward in the identification of potential pro-toxins/toxins in those individuals phenotyped as poor metabolisers (Controls, Parkinson's disease and Amyotrophic lateral sclerosis subjects).

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lateral sclerosis; Biomarker

Research data for this article

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